Supplemental Materials

Avra Valley Land Inventory

Submitted by Tucson Audubon Society

For The City of Tucson, Arizona

August 2006

Farm Identification

Group	Farm	RP #	Asset #	Purchase Date	Survey Date	Archaeological Survey Date	Parcel#	Section, Township, Range, Legal Description	Mapped Land Use	Total Acres	Irrigated Acres
G1	Hurst Farm	1443	23723	1/14/76	5/22/02	5/12/2005 See attached Cultural Resources Survey	20815019K, 20815019H, 20816019K	T11S R10E, most of west 1/2 Sec. 27 and east 1/3 of Sec. 28	Open Space Undisturbed, Agricultural Land Out of Production, Open Space River	463	296
G1	Martin Farm	1740	23709	7/11/84	6/30/03		208140020, 208140030	T11S R10E, NW 1/4 and N 1/2 of SW 1/4 of Sec. 24	Agricultural Land Out of Production, Open Space River, Open Space Undisturbed	240	184
G1	Santa Cruz Farm	1771	23716	3/4/86	1/19/01 9/20/01 11/7/01 5/21/01	5/12/2005 See attached Cultural Resources Survey	208120190	T11S R10E Most of Section 16, Approx. 1/2 of Sec. 15, north 1/2 section 22	Agricultural Land Out of Production	1112	910
G1	Simpson Farm North	1571	23717	6/12/79	1/19/01 9/20/01 11/7/01	5/12/2005 See attached Cultural Resources Survey	20812010B	T11S R10E, Sec. 15, portions of the north and east 1/2	Open Space River, Agricultural Land Out of Production	324	132
G1	Simpson Farm South	1571	23718	6/12/79	1/19/01 9/20/01 11/7/01	5/12/2005 See attached Cultural Resources Survey	20812014B	T11S R10E , Sec. 22	Open Space Undisturbed, Agricultural Land Out of Production	314	111
G2	Chu Farm	1742	23710	10/19/84	5/22/02 7/1/02		21520092B	T12S R11 most of south 1/2 Sec. 20	Agricultural Land Out of Production	300	294
G2	Comiskey Farm	1425	23737	9/2/75	12/12/01 3/21/02 3/21/02		215300020	T12S R11E Section 30 Lots 1 2 & 3 & SE 1/4 & the E1/2 W1/2	Open Space Undisturbed, Agricultural Land Out of Production	496	371
G2	Gin Farm	1446	23731	1/30/76	4/3/03		208240017B, 208240140, 208240130, 20824017A, 20824018A, 20824018B	T12S R10E, NE of Sec. 11 and most of W2/3 of Sec. 12	Agricultural Land Out of Production, Open Space River	477	437

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Group	Farm	RP #	Asset #	Purchase Date	Survey Date	Archaeological Survey Date	Parcel#	Section, Township, Range, Legal Description	Mapped Land Use	Total Acres	Irrigated Acres
G2	James Glover Farm	1461	23728	4/30/76	7/2/03		215180060, 215170300	T12S R11E, SE 1/4 of Sec. 18 and a portion of the SW 1/4 of Sec. 17	Agricultural Land Out of Production, Open Space Undisturbed,	187	159
G2	Levkowitz Farm	1441	23725	1/13/76	12/12/01 3/21/02		215300010	T12S R11E Sec. 30	Open Space Undisturbed, Agricultural Land Out of Production	152	0
G2	Lupori Farm	1776	23713	7/16/86	3/21/2002 7/14/05		208290210, 208290200	T12S R10E Sec. 24	Open Space Undisturbed, Agricultural Land Out of Production	320	320
G2	Reeves Farm North	1735	23706	6/12/84	7/14/05		208300280, 208300010	T12S R10E Sec. 25	Open Space Undisturbed, Agricultural Land Out of Production	405	277
G2	Reeves Farm South	1735	23707	6/12/84	7/14/05		208320700, 208320460	T12S R10E Sec. 35, the south 1/2 and the northwest 1/4, except the northwest 1/4 of the northwest 1/4	Open Space Undisturbed	437	0
G2	Weinstein Farm	1442	23724	1/14/76	7/14/05		208290060	T12S R10E, the southwest quarter of Sec. 14	Open Space Undisturbed, Agricultural Land Out of Production	148	92
G3	Anway Farm	1558	23727	2/9/79	11/27/02 4/6/99		208390250	T13S R10E, most of the E 1/2 of Sec. 8	Agricultural Land Out of Production	290	235
G3	Edward Anway Farm	1226	23722	4/7/76	4/1/99		208390040, 208390050, 208390060	T13S R10E, Sec. 5	Open Space Undisturbed, Open Space River, Agricultural Land Out of Production	188	155
G3	Flying “E” Bar Farm	1226	23735 (North) 23736 (South)	11/17/72	11/27/02		20833004A, 20833004B, 208390220	T12S R10E Sec. 31& T13N R10W Sec. 6. Approx. the E 1/2 of Sec. 31 and approx the E 1/2 of Sec. 6	Open Space Undisturbed, Agricultural Land Out of Production	706	660
G3	John Kai Farms (AKA Hughes-Kai Farm)	1460	23729	3/17/76	11/27/02		208330230	T12S R 10E Sec. 33	Agricultural Land Out of Production	633	470
G3	Tucker Farm	1744	23712	12/21/84	11/27/02		208390030, 20839002A, 20839002B	T13S R10E, most of Sec. 4	Agricultural Land Out of Production	608	608
G4	98 Farm	1471	23720	3/31/76	6/22/01		21117015A, 211100050, 211100010	TS14 R11E Sec. 4	Agricultural Land Out of Production	313	263

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Group	Farm	RP #	Asset #	Purchase Date	Survey Date	Archaeological Survey Date	Parcel#	Section, Township, Range, Legal Description	Mapped Land Use	Total Acres	Irrigated Acres
G4	Bowden Farm	1736	28705 (North) 28706 (South)	6/29/94	3/29/05 6/29/02		208410440, 208450030,	T13S R10E, South 1/2 and NW 1/2 of the NE 1/4 of Sec. 13 and South 1/2 of Sec. 14. (Another portion of Bowden Farm, south of Manville Rd, is included in Parcel 21, which is the Clearwater Project).	Agricultural land out of production, SW corner of Bowden: Open Space Undisturbed, Open Space River	1018	1005
G4	Cactus Co.- Avra Farm	1470	28918 (East) 28919 (West)	5/6/76	6/29/02		208440690, 208450010, 208450100	T13S R10E East 1/2 Sec. 22, all of Sec. 23 and 26	Agricultural Land Out of Production	1604	1540
G4	Cactus Co.- Milewide Farm	1472	North: 28922 South: 28923	5/6/76	6/22/01		213320250, 21114007C	T13S R11E, Sec. 31	Agricultural Land Out of Production	1373	1287
G4	Davison Farm	1440	28920 (East) 28921 (West)	12/31/75	3/25/02		213310240, 208450060, 208450070, 208450080, 208450090	TS13 R10E Sec. 25	Agricultural Land Out of Production	650	628
G4	Jarvis Farm North	1730	23702	4/6/84	3/29/05		208410270, 208410350, 20841034A, 20845005A	T13S R10E, NE 1/4 of Sec. 11, the NW 1/4 and the W 1/2 of the E 1/2 of Sec. 12	Open Space Undisturbed, Open Space River	481	0
G4	Jarvis Farm South	1730	23703	4/6/84	3/25/02 6/29/02		208450020, 20845005A	T14S RIIE Sec. 24	Agricultural Land Out of Production	633	633
G4	Nichols Farm	1743	23711	12/7/84	3/29/05		208420010, 208440690, 208410480, 20841026A	T13S R10E, Sec. 11: W 1/2; Sec. 14: NW 1/4; Sec.15: E 1/2	Agricultural Land Out of Production	806	772
G4	Trust No. 205	1445	23738	2/3/76	6/24/05		20843036A	T13 R10E, portion of Sec. 20	Open Space Undisturbed, Open Space River	349	0
G4	Wallis Farm	1500	23721	5/5/77	6/22/01	Archeological artifacts reported in the SW area.	21116006A	T14S R11E Sec. 8	Agricultural Land Out of Production	1278	811

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Group	Farm	RP #	Asset #	Purchase Date	Survey Date	Archaeological Survey Date	Parcel#	Section, Township, Range, Legal Description	Mapped Land Use	Total Acres	Irrigated Acres
G5	Double Z. S. Farm	1189	28707 (East) 28708 (West)	3/19/76	6/22/01		21136023C, 21134023F, 21134023E	TS14 R11E Sec. 34	Agricultural Land Out of Production	496	496
G5	Growers Finance Farm	1189	28924 (East) 28925 (West)	3/31/76	9/1/04		21135018D, 211270010, 211350170, 21134016C	T14S R11E, portions of Sec. 22, 27, 28, 29, 33, and 34	Agricultural Land Out of Production	1580	1428
G5	Hill Farm	1152	23733	6/30/71	6/22/01		209130010	T15S R11NE, Sec. 11	Institutional, Agricultural Land Out of Production, Open Space Undisturbed	317	307
G5	Morse Farm	1189	23704	3/14/75	6/22/01 6/6/05		21136022A	TS14 R11E Sec. 33	Agricultural Land Out of Production	310	303
G6	Buckelew Farm	1745	28916 (East) 28917 (West)	12/31/84	12/12/01 5/16/02	Survey Pending, 7/6/06	208550020, 208550010, 208540230, 208540270, 208540410, 208541330	T15S R10E, all of Sec. 22; East half of Sec. 21; SE 1/4 of SW 1/4 of Sec. 21; approx. 3/4 of Sec. 28; and most of the NW 1/4 of Sec. 33	Agricultural Land Out of Production, Open Space River, Open Space Undisturbed	1540	590
G6	Duval/ Penzoil Farm	1788	23714 (East) 23715 (West)	11/25/86	8/31/05		208541350, 20854134B, 30119002E, 30119006B, 30119006A, 30119004A, 30119005G	T16S R10E, Portions of Sec. 5, 6, 7, 8, 16, 18 and T15S R10E portion of the south 1/4 of Sec. 33	Agricultural Land Out of Production, Open Space River, Open Space Undisturbed	1515	549

Farm Site Information

Group	Farm	Elevation (Approx. in feet)	Location/Cross Streets	Gate Locations	Fence Status	Structures
G1	Hurst Farm	1885-1915	East of N Antelope Rd, South of W Trico Marana Rd, North of Moore Rd	Mid North property line off W Trico Marana Rd, South property line off Moore Rd	New fence on the North and East property line, old fence on the West and South property line	Foundation remains of old house in the NE area.
G1	Martin Farm	1915-1950	South of West Treatment Plant Rd, Northwest pf W Trico Marana Rd, West of Luckett Rd	East property line near Linda Ln	New fence on the East property line, East 1/4 of the South property line and the East 2/3 of the North property line. No fence on the West property line or remaining South property line	
G1	Santa Cruz Farm	1885-1925	South of Hardin Rd, East of N Trico Rd, Northeast of W Silverbell Rd	SE property corner	New fence on the West and North property lines, no fence bordering Simpson Farm North or Simpson Farm South	
G1	Simpson Farm North	1890-1900	South of Hardin Rd, East of N Trico Rd	SW corner off of Hardin Rd. &Trico Rd, 4 gates located on the East property line off of N Trico Rd	New fence on the North and East property line, no fence bordering Santa Cruz Farm	
G1	Simpson Farm South	1905-1915	W Trico Marana Rd. & Silverbell	NE and SE property corners, intersection of W Trico Marana Rd and W Silverbell Rd	New fence on the west property line and the South property line between N Trico Rd and W Silverbell Rd, no fence on the South property line West of W Silverbell Rd nor bordering Santa Cruz Farm	
G2	Chu Farm	2015-2040	South of W. Overton Road, West of N Sanders Rd, East of N Avra Rd, North of Emigh Rd	NE and SE property corners off of N Sanders Rd	Entire perimeter has new fence	
G2	Comiskey Farm	2015-2055	North of Magee Rd, East of N. Avra Rd, Emigh Rd ends at the NE property corner	SE corner off of N Avra Rd, a future gate is scheduled for installation at the SE property area off Magee Rd	No fence currently. New fence scheduled for the North, West and South property lines. No fence scheduled bordering Levkowitz Farm, old fence on the lower 1/2 of the East property line	
G2	Gin Farm	1955-1990	North of W Avra Valley Rd, Garvey Rd bisects the farm North and South, East of N Trico Rd	Lower SW corner, North property line East of Garvey Rd	Entire perimeter has new fence	

Gate and fence locations courtesy of Christopher Lopez, Environmental Inspector, Tucson Water

Farm Site Information

Group	Farm	Elevation (Approx. in feet)	Location/Cross Streets	Gate Locations	Fence Status	Structures
G2	James Glover Farm	1995-2005	Take Sandario Rd to W Twin Peaks Rd (West), N Avra Rd bisects the East side of the property	No gate	Entire perimeter scheduled for new fencing	
G2	Levkowitz Farm	2015-2025	West of N. Avra Rd. & South of Emigh Rd.	No gate, enter through Comisky Farm	New fence on the East property line, new fence scheduled for the North property line and no fence bordering Comisky Farm	
G2	Lupori Farm	2000-2030	East of N Garvey Road, North of Reeves Farm North, East of N Maggies Farm Ln	SW property corner. Enter through Reeves farm North via N Nelson Quihuis Rd	Entire perimeter old fence	
G2	Reeves Farm North	2010-2060	N Nelson Quihuis Rd bisects the center of the property South/North, North of Prickle Desert Rd, Magees Rd parallels the SE property corner	Mid South property line along N Nelson Quihuis Rd, SE property corner off of W Prickle Desert Rd, Mid North property line access to Lupori Farm	New fence on the South property line, old fence on the North property line, New fence scheduled for the west property line and the far South property line on the Eastern 1/3 of the farm, no fence bordering Comisky Farm	Farm house occupied by Christopher Lopez, TW
G2	Reeves Farm South	2035-2070	North of Tucker Rd, Shadows Desert Ln bisects the center of the property South to North, South of Magee Rd, East of Trico Rd	NW and SW property corners off of Trico Rd	New fence on the West property line, new fence scheduled for the remaining perimeter	
G2	Weinstein Farm	2000-2010	West of N Garvey Rd, South of W El Paso Gas Rd	No gate	Entire perimeter scheduled for new fencing	
G3	Anway Farm	2060-2100	North of W Sunset Rd, South of W Orange Grove Rd, West of N Aguirre Rd, East of N Eakers Ave	Mid South property line off of W Sunset Rd	Old fence entire perimeter except bordering Glenn Jones Property to the Northeast	Glenn Jones property located to the NE of the Anway Farm
G3	Edward Anway Farm	2010-2080	South of W Tucker Rd, West of N Aguirre Rd, North of W Orange Grove Rd	SE property corner off of N Aguirre Rd, 2 gates on the South property line off of W Orange Grove Rd	New fence scheduled for the North property line and the West 1/4 of the South property line, no fence bordering Tucker Farm to the East, Flying "E" Bar farm to the West nor Anway farm to the South	
G3	Flying “E” Bar Farm	2020-2065	W Tucker Rd bisects the property East to West, W Orange Grove Rd intersects the SE property corner.	SE property corner, 3 gates off of Tucker Rd, community gas gate on the North property line	Entire perimeter has new fence	

Gate and fence locations courtesy of Christopher Lopez, Environmental Inspector, Tucson Water

Farm Site Information

Group	Farm	Elevation (Approx. in feet)	Location/Cross Streets	Gate Locations	Fence Status	Structures
G3	John Kai Farms (AKA	2035-2055	North of W. Tucker, East of N Anway Rd, South of W Magee Rd	2 gates along the West property line	Entire perimeter has new fence	
G3	Tucker Farm	2065-2090	West of N Anway Rd, South of W Tucker Rd, North of W Orange Grove Rd, East of N Aguirre Rd	NE property corner off of W Tucker Rd, SW property corner off of N Aguirre Rd	Entire perimeter has new fence	Avra Valley Fire Department occupies the land East of the SE property corner
G4	98 Farm	2225-2240	South of Manville Rd, East of N Avra Rd, Southwest of San Joaquin Rd	No gate, enter through Wallis Farm	Entire perimeter has new fence except bordering Wallis Farm	
G4	Bowden Farm	2110-2180	W Manville Rd is South of the West portion of the farm then bisects the Eastern portion, N Reservation Rd parallels the Southwest property line then bisects through the farm Northward, East of N Trico Rd	West of Reservation Rd and North of W Manville Rd, Far SW property corner area, Inner SW corner North of Manville Rd	No fence on Nichols Farm, Jarvis Farm South and Davison Farm border Bowden. New fence on the North, Southwest property lines	Farm house located West of Reservation Rd
G4	Cactus Co.- Avra Farm	2080-2165	South of Manville Rd, Trico Rd bisects property on West side from South to North, East of Little Cody Rd, North of W Ft Lowell Rd	SE property corner off of Ft Lowell Rd, Inner SW property corner off of N Trico Rd, South side of W Manville Rd on N Trico Rd	Old fence on North property line, new fence on the West and South property lines	
G4	Cactus Co.- Milewide Farm (CAVSARP)	2140-2245	South of Ft Lowell Rd, West of N Avra Rd, East of Luckett Rd, W Milewide Rd bisects property East to West	Gate A and Gate B on either side of W Milewide Rd central property area	New fence on the North, West and South property lines.	Recharge Basin located toward the center of the farm, a plateau formed from the earth excavated from CAP is located in the NW property corner area
G4	Davison Farm (PARTIALLY CAVSARP)	2170-2190	Reservation Rd bisects the property on the West side, Luckett Rd bisects the center of the property South to North, North of Ft Lowell Rd, West of N Avra Rd	Mid North property area Westside of Luckett Rd, 2 gates on South property line off of W Ft Lowell Rd	West side of Luckett Rd, South property line from N Luckett Rd Westward.	Farm house located East of Reservation Rd, East of Luckett Rd is a plateau formed from the earth excavated from CAP. TIMPA controls a portion of the East side of the farm.

Gate and fence locations courtesy of Christopher Lopez, Environmental Inspector, Tucson Water

Farm Site Information

Group	Farm	Elevation (Approx. in feet)	Location/Cross Streets	Gate Locations	Fence Status	Structures
G4	Jarvis Farm North	2090-2095	East of N. Shadows Desert Ln, South of Orange Grove, N Reservation Rd parallels the lower West property line	No gate	New perimeter fence except South of the West Branch of the Brawley Wash on the East property line, and on the West property line where Jarvis Farm North borders the Nichols Farm and the South property line where Jarvis Farm North borders the Bowden Farm	
G4	Jarvis Farm South	2150-2175	South of Manville Rd, Reservation Rd Parallels the East property line then bisects the Southern portion of the property	2 gates located on the West side of Reservation Rd	New fence on the North and East property line. Bordered by Cactus Avra Farm to the West, Bowden Farm to the East and Davison Farm to the South	
G4	Nichols Farm	2140 in SW corner to 2100 in NE corner	South of W Orange Grove Rd, East and South of Sunset Rd, North of W Manville Rd, N Trico Rd parallels the lower East and upper West property line bisecting through the center of the farm.	Far SE property corner off of W Manville Rd	Perimeter has new fence except where Nichols Farm borders Bowden Farm in the SE and Jarvis Farm North to the NE	
G4	Trust No. 205	2140-2190	South of W Manville Rd	No gate	Entire perimeter scheduled for fencing	
G4	Wallis Farm (CAVSARP)	2200-2460	South of Manville Rd, East of N Avra Rd, Southwest of San Joaquin Rd	NE property area, South of W Manville Rd	Entire perimeter has new fence except the area where the wash parallels the West property line	Several CAVSARP Recharge Basins (Approx. 10)
G5	Double Z. S. Farm	2300-2320	South of W Donaldson Ranch Rd, North of Snyder Hill Rd, Sandario Rd bisects through the center of the farm North and South, East of S Tara Ln	SE property corner	No fence on the West property line bordered by Morse Farm nor to the North bordered by Growers Finance Farm. New fence on the East and South property lines	

Gate and fence locations courtesy of Christopher Lopez, Environmental Inspector, Tucson Water

Farm Site Information

Group	Farm	Elevation (Approx. in feet)	Location/Cross Streets	Gate Locations	Fence Status	Structures
G5	Growers Finance Farm	2285-2330	North of W Donaldson Ranch Rd and W Snyder Hill Rd, Bopp Rd bisects the lower Eastern section of the farm, S Sandario Rd bisects the center if the property in a North and South direction, S Marstellar Rd bisects the West side of the farm,	5 gates off of Sandario Rd, ! In the NW corner, 2 on the inner NW corner, 2 on the inner SW corner, Another gate is located off of W Donaldson Ranch Rd in the far SW corner	Old fence currently lines the perimeter of the farm except where the farm borders Morse Farm and Double Z.S. Farm. New fence is scheduled. No fence exists on the far SW property line. New fence parallels the East side of S Sandario Rd	
G5	Hill Farm	2380-2385	North of Ajo Way (Hwy 86) and Valencia Rd, West of S Continental Rd, South of West Park Rd	Enter via S Continental Rd, SE property corner	Entire perimeter is old fence	Hill Farm is located just West of Ryan Air Field
G5	Morse Farm	2320-2335	South of W Donaldson Ranch Rd, North of Snyder Hill Rd, East of Marstellar Rd	NW property corner	Fenced on the South property line and 3/4 of the West property line excluding the North 1/4. East bordered by Double Z.S. Farm. North is bordered by Growers Finance Farm	
G6	Buckelew Farm	2485-2520	North of W Ajo Hwy, W Hermans Rd bisects the farm East to West	SW property corner via S Foller Rd, Southeast property line via S howling Coyote Trail	New fence on the upper Eastern property line and Southeast property line, old fence on the North and West property line, new fence scheduled for the lower East property line	Humane Borders Water Station
G6	Duval/ Penzoil Farm	2540-2635	South of W Aho Hwy, West of Robles Jct.	South of W Aho Hwy, 1st left past Robles Jct., NE and NW property corners, the far SE property corner	Old fence on the North property line, New fence on most of the Eastern property line with old fence in the southern portion of the East property line, new fence scheduled for the upper West property line. No fence exists along the Brawley Wash	Humane Borders Water Station, Military Test Station for Surveillance Aircraft, old cattle pens, abandoned air strip

Gate and fence locations courtesy of Christopher Lopez, Environmental Inspector, Tucson Water

City of Tucson Well Inventory

Group	Farm	COT Well Map ID	Total # Wells	Well Type	Well #	ADWR #	LAT	LONG	T	R	S	Address
G1	Hurst Farm	11S10E	3	MONITORED	**AF-003A**	620212	32°26'52"	111°18'57"	11	10	27	Hurst Farm
G1	Hurst Farm	11S10E		MONITORED	**AF-004A**	620213	32°26'12"	111°18'58"	11	10	27	Hurst Farm
G1	Hurst Farm	11S10E		MONITORED	**AF-005A**	620214	32°26'12"	111°18'59"	11	10	27	Hurst Farm
G1	Martin Farm	11S10E	1	MONITORED	**AF-047A**	600284	32°27'42"	111°16'43"	11	10	24	Martin Farm
G1	Santa Cruz Farm	11S10E	5	MONITORED	**AF-057A**	626688	32°27'57"	111°18'46"	11	10	15	Santa Cruz Farm
G1	Santa Cruz Farm	11S10E		ACTIVE	**AF-058A**	626689	32°28'2"	111°18'16"	11	10	15	14601 N. Trico Rd
G1	Santa Cruz Farm	11S10E		MONITORED	**AF-059A**	626687	32°27'30"	111°18'18"	11	10	22	Santa Cruz Farm
G1	Santa Cruz Farm	11S10E		MONITORED	**CF-016A**	0	32°27'30"	111°18'17"	11	10	22	Santa Cruz Farm
G1	Santa Cruz Farm	11S10E		MONITORED	**CF-017A**	626690	32°27'40"	111°19'8"	11	10	22	Santa Cruz Farm
G1	Simpson Farm North	11S10E	2	ACTIVE	**AF-001A**	620210	32°28'37"	111°18'16"	11	10	15	15045 N. Trico Rd
G1	Simpson Farm North	11S10E		MONITORED	**WR-020A**	620339	32°28'42"	111°18'17"	11	10	15	Simpson Farm North
G1	Simpson Farm South	11S10E	2	MONITORED	**AF-002A**	620211	32°27'4"	111°18'15"	11	10	22	Simpson Farm South
G1	Simpson Farm South	11S10E		MONITORED	**WR-038A**	620342	32°27'5"	111°18'16"	11	10	22	Simpson Farm South
G2	Chu Farm	12S11E	1	MONITORED	**AF-048A**	631704	32°22'6"	111°14'4"	12	11	20	Chu Farm
G2	Comiskey Farm	12S11E	5	MONITORED	**AF-020A**	620240	32°21'7"	111°15'34"	12	11	30	Comiskey Farm
G2	Comiskey Farm	12S11E		MONITORED	**AF-021A**	620241	32°21'11"	111°15'3"	12	11	30	Comiskey Farm
G2	Comiskey Farm	12S11E		MONITORED	**AF-022A**	620242	32°21'7"	111°15'6"	12	11	30	Comiskey Farm
G2	Comiskey Farm	12S11E		MONITORED	**WR-016A**	620334	32°21'7"	111°15'20"	12	11	30	Comiskey Farm
G2	Comiskey Farm	12S11E		MONITORED	**WR-016B**	620335	32°21'7"	111°15'20"	12	11	30	Comiskey Farm
G2	Gin Farm	12S10E	4	MONITORED	**AF-012A**	620221	32°24'2"	111°17'2"	12	10	12	Gin Farm
G2	Gin Farm	12S10E		MONITORED	**AF-013A**	620222	32°23'38"	111°16'59"	12	10	12	Gin Farm
G2	Gin Farm	12S10E		MONITORED	**AF-014A**	604240			13	10	25	

Credit: 2005 Tucson Water 2005 Well Atlas. For more information about well statuses and locations contact Tucson Water, Research and Technical Support section staff at 520.791.5080.Well locations coutesy of Charles Faas, Tucson Water.

City of Tucson Well Inventory

Group	Farm	COT Well Map ID	Total # Wells	Well Type	Well #	ADWR #	LAT	LONG	T	R	S	Address
G2	Gin Farm	12S10E		MONITORED	**WR-015A**	620333	32°23'42"	111°16'58"	12	10	12	Gin Farm
G2	James Glover Farm	12S11E	2	MONITORED	**AF-018A**	620227	32°22'55"	111°15'37"	12	11	18	Glover Farm
G2	James Glover Farm	12S11E		MONITORED	**AF-019A**	620228	32°22'51"	111°15'16"	12	11	18	Glover Farm
G2	Levkowitz Farm	12S11E	0		**None**							
G2	Lupori Farm	12S10E	2	MONITORED	**AF-060A**	603914	32°21'52"	111°16'44"	12	10	24	Lupori Farm
G2	Lupori Farm	12S10E		MONITORED	**AF-061A**	804155	32°21'52"	111°16'43"	12	10	24	Lupori Farm
G2	Reeves Farm North	12S10E	3	MONITORED	**AF-043A**	623950	32°21'25"	111°17'13"	12	10	26	Reeves Farm
G2	Reeves Farm North	12S10E		MONITORED	**AF-070A**	623951	32°21'48"	111°17'19"	12	10	26	Reeves Farm
G2	Reeves Farm North	12S10E		ACTIVE	**AF-071A**	623952	32°21'34"	111°17'14"	12	10	26	Reeves Farm
G2	Reeves Farm South	12S10E	0		**None**							
G2	Weinstein Farm	12S10E	1	MONITORED	**WR-046A**	620345	32°22'50"	111°17'43"	12	10	14	Weinstein Farm
G3	Anway Farm	13S10E	1	MONITORED	**WR-039A**	620343	32°18'25"	111°20'19"	13	10	8	Anway Farm
G3	Edward Anway Farm	13S10E	2	MONITORED	**AF-023A**	620243	32°19'15"	111°20'19"	13	10	5	Edward Anway Farm
G3	Edward Anway Farm	13S10E		MONITORED	**WR-042A**	620344	32°19'17"	111°20'20"	13	10	5	Edward Anway Farm
G3	Flying “E” Bar Farm	12S10E 13S10E	3	MONITORED	**AF-015A**	620224	32°20'40"	111°21'58"	12	10	31	Flying E Bar Farm
G3	Flying “E” Bar Farm	12S10E 13S10E		MONITORED	**AF-024A**	620244	32°19'14"	111°21'28"	13	10	6	Flying E Bar Farm
G3	Flying “E” Bar Farm	12S10E 13S10E		MONITORED	**WR-018A**	620337	32°20'6"	111°21'35"	12	10	31	Flying E Bar Farm
G3	(AKA Hughes-Kai Farm)	12S10E	3	MONITORED	**AF-016A**	620225	32°20'7"	111°19'58"	12	10	33	Kai Farm
G3	(AKA Hughes-Kai Farm)	12S10E		MONITORED	**AF-017A**	620226			12	10	33	Kai Farm
G3	(AKA Hughes-Kai Farm)	12S10E		MONITORED	**WR-017A**	620336	32°20'8"	111°19'54"	12	10	33	Kai Farm
G3	Tucker Farm	13S10E	3	MONITORED	**AF-053A**	621674	32°19'14"	111°19'48"	13	10	4	Tucker Farm
G3	Tucker Farm	13S10E		ACTIVE	**AF-054A**	621673	32°19'14"	111°19'17"	13	10	4	Tucker Farm

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G3	Tucker Farm	13S10E		ACTIVE	**AF-069A**	621675			13	10	4	6301 N Anway
G4	98 Farm	14S11E CAVSARP	7	MONITORED	**AF-035A**	620255	32°14'13"	111°13'37"	14	11	4	98 Farm
G4	98 Farm	14S11E CAVSARP		MONITORED	**WR-413A**	582808			14	11	9	98 Farm
G4	98 Farm	14S11E CAVSARP		MONITORED	**WR-413B**	583988			14	11	9	98 Farm
G4	98 Farm	14S11E CAVSARP		MONITORED	**WR-414A**	591506	32°13'44"	111°13'53"	14	11	9	98 Farm
G4	98 Farm	14S11E CAVSARP		MONITORED	**WR-415A**	582809			14	11	4	98 Farm
G4	98 Farm	14S11E CAVSARP		MONITORED	**WR-416A**	591505	32°14'24"	111°14'6"	14	11	4	98 Farm
G4	98 Farm	14S11E CAVSARP		MONITORED	**WR-416B**	591502			14	11	4	98 Farm
G4	Bowden Farm	13S10E	3	MONITORED	**AF-044A**	625808	32°17'31"	111°17'51"	13	10	14	15700 W. Manville Rd
G4	Bowden Farm	13S10E		MONITORED	**AF-046A**	625809	32°16'43"	111°16'42"	13	10	24	Bowden Farm
G4	Bowden Farm	13S10E		MONITORED	**WR-039A**	620343	32°18'25"	111°20'19"	13	10	8	Anway Farm
G4	Cactus Co.- Avra Farm	13S10E	5	MONITORED	**AF-026A**	620246	32°16'39"	111°18'46"	13	10	22	Cactus Avra Farm
G4	Cactus Co.- Avra Farm	13S10E		MONITORED	**AF-027A**	620247	32°16'38"	111°17'45"	13	10	23	Cactus Avra Farm
G4	Cactus Co.- Avra Farm	13S10E		MONITORED	**AF-029A**	620249	32°15'46"	111°18'0"	13	10	26	Cactus Avra Farm
G4	Cactus Co.- Avra Farm	13S10E		MONITORED	**AF-030A**	620250	32°15'46"	111°17'30"	13	10	26	Cactus Avra Farm
G4	Cactus Co.- Avra Farm	13S10E		MONITORED	**AF-049A**	626414	32°16'38"	111°18'16"	13	10	22	Cactus Avra Farm
G4	Cactus Co.- Milewide Farm	14S11E CAVSARP	57	ACTIVE	**AF-031B**	584734			13	11	30	14192 W Milewide Rd
G4	Cactus Co.- Milewide Farm	14S11E CAVSARP		MONITORED	**AF-032A**	620252	32°14'54"	111°16'11"	13	11	31	Cactus Milewide Farm
G4	Cactus Co.- Milewide Farm	14S11E CAVSARP		ACTIVE	**AF-032B**	584892	32°14'54"	111°16'10"	13	11	31	14150 W. Mile Wide Road
G4	Cactus Co.- Milewide Farm	14S11E CAVSARP		MONITORED	**AF-033A**	620253	32°14'54"	111°16'9"	13	11	31	Cactus Milewide Farm
G4	Cactus Co.- Milewide Farm	14S11E CAVSARP		MONITORED	**AF-034A**	620254	32°14'54"	111°15'41"	13	11	31	Cactus Milewide Farm
G4	Cactus Co.- Milewide Farm	14S11E CAVSARP		MONITORED	**AF-034A**	620254	32°14'54"	111°15'41"	13	11	31	Cactus Milewide Farm

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G4	Cactus Co.-Milewide Farm	14S11E CAVSARP		ACTIVE	**AF-034B**	557821	32°14'57"	111°15'40"	13	11	31	13800 W. Mile Wide
G4	Cactus Co.-Milewide Farm	14S11E CAVSARP		MONITORED	**AF-037A**	620257	32°14'2"	111°15'56"	14	11	6	Cactus Milewide Farm
G4	Cactus Co.-Milewide Farm	14S11E CAVSARP		ACTIVE	**AF-037B**	574904	32°14'3"	111°16'4"	14	11	6	14199 W. Mile Wide Road
G4	Cactus Co.-Milewide Farm	14S11E CAVSARP		MONITORED	**AF-038A**	620258	32°14'2"	111°15'38"	14	11	6	Cactus Milewide Farm
G4	Cactus Co.-Milewide Farm	14S11E CAVSARP		MONITORED	**AF-039A**	620259	32°13'51"	111°15'42"	14	11	7	Cactus Milewide Farm
G4	Cactus Co.-Milewide Farm	14S11E CAVSARP		MONITORED	**AF-039A**	620259	32°13'51"	111°15'42"	14	11	7	Cactus Milewide Farm
G4	Cactus Co.-Milewide Farm	14S11E CAVSARP		ACTIVE	**AF-039B**	574905	32°13'49"	111°15'47"	14	11	7	13901 W. Mile Wide Road
G4	Cactus Co.-Milewide Farm	14S11E CAVSARP		ACTIVE	**CA-012A**	585726	32°14'26"	111°15'29"	14	11	6	13687 W. Mile Wide Road
G4	Cactus Co.-Milewide Farm	14S11E CAVSARP		ACTIVE	**CA-013A**	585038	32°15'4"	111°15'27"	13	11	31	13506 W. Mile Wide Road
G4	Cactus Co.-Milewide Farm	14S11E CAVSARP		ACTIVE	**CA-014A**	586181	32°15'20"	111°15'36"	13	11	31	13786 W. Mile Wide Road
G4	Cactus Co.-Milewide Farm	14S11E CAVSARP		ACTIVE	**CA-016A**	587296	32°14'28"	111°15'59"	14	11	6	14156 W. Mile Wide Road
G4	Cactus Co.-Milewide Farm	14S11E CAVSARP			**CA-016B**							
G4	Cactus Co.-Milewide Farm	14S11E CAVSARP		ACTIVE	**CA-017A**	588633	32°15'20"	111°16'9"	13	11	31	14190 W. Mile Wide Road
G4	Cactus Co.-Milewide Farm	14S11E CAVSARP		PENDING	**CA-018A**	201430	32°13'11"	111°14'39"	14	11	8	Cactus Milewide Farm
G4	Cactus Co.-Milewide Farm	14S11E CAVSARP		MONITORED	**WR-028A**	620340	32°14'1"	111°15'57"	14	11	7	Cactus Milewide Farm
G4	Cactus Co.-Milewide Farm	14S11E CAVSARP		MONITORED	**WR-254A**				13	11	31	Cactus Milewide Farm
G4	Cactus Co.-Milewide Farm	14S11E CAVSARP		MONITORED	**WR-255A**				13	11	31	Cactus Milewide Farm
G4	Cactus Co.-Milewide Farm	14S11E CAVSARP		MONITORED	**WR-256A**				13	11	31	Cactus Milewide Farm
G4	Cactus Co.-Milewide Farm	14S11E CAVSARP		MONITORED	**WR-257A**				13	11	31	Cactus Milewide Farm
G4	Cactus Co.-Milewide Farm	14S11E CAVSARP		MONITORED	**WR-257B**	558474			13	11	31	Cactus Milewide Farm
G4	Cactus Co.-Milewide Farm	14S11E CAVSARP		MONITORED	**WR-258A**				13	11	31	Cactus Milewide Farm
G4	Cactus Co.-Milewide Farm	14S11E CAVSARP		MONITORED	**WR-259A**				13	11	31	Cactus Milewide Farm

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G4	Cactus Co.-Milewide Farm	14S11E CAVSARP		MONITORED	**WR-260A**				13	11	31	Cactus Milewide Farm
G4	Cactus Co.-Milewide Farm	14S11E CAVSARP		MONITORED	**WR-261A**	55875			13	11	31	Cactus Milewide Farm
G4	Cactus Co.-Milewide Farm	14S11E CAVSARP		MONITORED	**WR-261B**				13	11	31	Cactus Milewide Farm
G4	Cactus Co.-Milewide Farm	14S11E CAVSARP		MONITORED	**WR-262A**	558257	32°15'30"	111°15'26"	13	11	31	Cactus Milewide Farm
G4	Cactus Co.-Milewide Farm	14S11E CAVSARP		MONITORED	**WR-263A**	558256	32°15'30"	111°15'25"	13	11	31	Cactus Milewide Farm
G4	Cactus Co.-Milewide Farm	14S11E CAVSARP		MONITORED	**WR-264A**	558259	32°15'5"	111°15'52"	13	11	31	Cactus Milewide Farm
G4	Cactus Co.-Milewide Farm	14S11E CAVSARP		MONITORED	**WR-265A**	558258	32°15'4"	111°15'52"	13	11	31	Cactus Milewide Farm
G4	Cactus Co.-Milewide Farm	14S11E CAVSARP		MONITORED	**WR-266A**	558255	32°15'1"	111°15'47"	13	11	31	Cactus Milewide Farm
G4	Cactus Co.-Milewide Farm	14S11E CAVSARP		MONITORED	**WR-267A**	558254	32°15'1"	111°15'47"	13	11	31	Cactus Milewide Farm
G4	Cactus Co.-Milewide Farm	14S11E CAVSARP		MONITORED	**WR-299A**	563467			13	11	31	Cactus Milewide Farm
G4	Cactus Co.-Milewide Farm	14S11E CAVSARP		MONITORED	**WR-300A**	563465			13	11	31	Cactus Milewide Farm
G4	Cactus Co.-Milewide Farm	14S11E CAVSARP		MONITORED	**WR-301A**	563468			13	11	31	Cactus Milewide Farm
G4	Cactus Co.-Milewide Farm	14S11E CAVSARP		MONITORED	**WR-302A**	563469			13	11	31	Cactus Milewide Farm
G4	Cactus Co.-Milewide Farm	14S11E CAVSARP		MONITORED	**WR-302B**	563469			13	11	31	Cactus Milewide Farm
G4	Cactus Co.-Milewide Farm	14S11E CAVSARP		MONITORED	**WR-303A**	563466			13	11	31	Cactus Milewide Farm
G4	Cactus Co.-Milewide Farm	14S11E CAVSARP		MONITORED	**WR-314A**	562750	32°15'2"	111°15'28"	13	11	31	Cactus Milewide Farm
G4	Cactus Co.-Milewide Farm	14S11E CAVSARP		MONITORED	**WR-322A**				13	11	31	Cactus Milewide Farm
G4	Cactus Co.-Milewide Farm	14S11E CAVSARP		MONITORED	**WR-322B**				13	11	31	Cactus Milewide Farm
G4	Cactus Co.-Milewide Farm	14S11E CAVSARP		MONITORED	**WR-322C**	567933			13	11	31	Cactus Milewide Farm
G4	Cactus Co.-Milewide Farm	14S11E CAVSARP		MONITORED	**WR-322D**	567932			13	11	31	Cactus Milewide Farm
G4	Cactus Co.-Milewide Farm	14S11E CAVSARP		MONITORED	**WR-327A**	572445			13	11	31	13800 W. Mile Wide
G4	Cactus Co.-Milewide Farm	14S11E CAVSARP		MONITORED	**WR-332A**	573021			13	11	31	Cactus Milewide Farm

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G4	Cactus Co.- Milewide Farm	14S11E CAVSARP		MONITORED	**WR-332B**	573021			13	11	31	Cactus Milewide Farm
G4	Cactus Co.- Milewide Farm	14S11E CAVSARP		MONITORED	**WR-417A**	582810			14	11	6	Cactus Milewide Farm
G4	Cactus Co.- Milewide Farm	14S11E CAVSARP		MONITORED	**WR-417B**	583990			14	11	6	Cactus Milewide Farm
G4	Cactus Co.- Milewide Farm	14S11E CAVSARP		MONITORED	**WR-418A**	591504	32°14'23"	111°16'10"	14	11	6	Cactus Milewide Farm
G4	Cactus Co.- Milewide Farm	14S11E CAVSARP		MONITORED	**WR-421A**	582812			13	11	31	Cactus Milewide Farm
G4	Cactus Co.- Milewide Farm	14S11E CAVSARP		MONITORED	**WR-421B**	583992			13	11	31	Cactus Milewide Farm
G4	Cactus Co.- Milewide Farm	14S11E CAVSARP		MONITORED	**WR-422A**	591501			13	11	31	Cactus Milewide Farm
G4	Davison Farm (Partially CAVSARP)	13S10E 13S11E	3	ACTIVE	**AF-028A**	620248	32°15'48"	111°16'42"	13	10	25	3520 N. Reservation Rd
G4	Davison Farm (Partially CAVSARP)	13S10E 13S11E		MONITORED	**AF-031A**	620251	32°15'46"	111°16'9"	13	11	30	Davison Farm
G4	Davison Farm (Partially CAVSARP)	13S10E 13S11E		ACTIVE	**CA-015A**	586192	32°15'50"	111°15'35"	13	11	30	13790 W. Mile Wide Road
G4	Jarvis Farm North	13S10E	0		**None**							
G4	Jarvis Farm South	13S10E	2	MONITORED	**AF-041A**	604240	32°16'12"	111°16'31"	13	10	25	Jarvis Farm
G4	Jarvis Farm South	13S10E		MONITORED	**AF-042A**	604241	32°16'15"	111°16'52"	13	10	25	Jarvis Farm
G4	Nichols Farm	13S10E	3	MONITORED	**AF-050A**	626413	32°17'30"	111°18'16"	13	10	15	Nichols Farm
G4	Nichols Farm	13S10E		MONITORED	**AF-051A**	626412	32°17'59"	111°18'14"	13	10	14	Nichols Farm
G4	Nichols Farm	13S10E		MONITORED	**AF-052A**	626411	32°17'57"	111°18'3"	13	10	14	Nichols Farm
G4	Trust No. 205	13S10E	2	MONITORED	**AF-025A**	620245	32°16'39"	111°21'2"	13	10	20	Trust #205 Farm
G4	Trust No. 205	13S10E		MONITORED	**WR-019A**	620338	32°17'8"	111°21'2"	13	10	20	Trust #205 Farm
G4	Wallis Farm (CAVSARP)	14S11E CAVSARP	48	MONITORED	**AF-036A**	620256	32°14'1"	111°14'58"	14	11	5	Wallis Farm
G4	Wallis Farm (CAVSARP)	14S11E CAVSARP		ACTIVE	**AF-036B**	571741	32°14'2"	111°14'53"	14	11	5	13195 W. Mile Wide Road
G4	Wallis Farm (CAVSARP)	14S11E CAVSARP		MONITORED	**AF-040A**	620260	32°13'10"	111°15'6"	14	11	8	Wallis Farm
G4	Wallis Farm (CAVSARP)	14S11E CAVSARP		ACTIVE	**AF-040B**	571743	32°13'10"	111°15'7"	14	11	8	13405 W. Mile Wide Road

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G4	Wallis Farm (CAVSARP)	14S11E CAVSARP		ACTIVE	**CA-001A**	572658	32°13'36"	111°14'39"	14	11	8	12991 W. Mile Wide Road
G4	Wallis Farm (CAVSARP)	14S11E CAVSARP		ACTIVE	**CA-002A**	579474	32°13'37"	111°14'10"	14	11	8	12615 W. Mile Wide Road
G4	Wallis Farm (CAVSARP)	14S11E CAVSARP		ACTIVE	**CA-003A**	575450	32°14'1"	111°14'9"	14	11	5	12605 W. Mile Wide Road
G4	Wallis Farm (CAVSARP)	14S11E CAVSARP		ACTIVE	**CA-004A**	576697	32°14'27"	111°14'26"	14	11	5	12855 W. Mile Wide Road
G4	Wallis Farm (CAVSARP)	14S11E CAVSARP		ACTIVE	**CA-005A**	579707	32°14'27"	111°14'53"	14	11	5	13151 W. Mile Wide Road
G4	Wallis Farm (CAVSARP)	14S11E CAVSARP		ACTIVE	**CA-006A**	582686	32°14'18"	111°14'41"	14	11	5	13071 W. Mile Wide Rd
G4	Wallis Farm (CAVSARP)	14S11E CAVSARP		ACTIVE	**CA-007A**	583137	32°13'59"	111°14'26"	14	11	8	12875 W. Mile Wide Rd
G4	Wallis Farm (CAVSARP)	14S11E CAVSARP		ACTIVE	**CA-008A**	579475	32°13'11"	111°14'12"	14	11	8	12655 W. Mile Wide Road
G4	Wallis Farm (CAVSARP)	14S11E CAVSARP		ACTIVE	**CA-009A**	583778	32°13'36"	111°15'6"	14	11	8	13391 W. Mile Wide Rd
G4	Wallis Farm (CAVSARP)	14S11E CAVSARP		ACTIVE	**CA-010A**	583891	32°14'17"	111°15'6"	14	11	5	13375 W. Mile Wide Rd
G4	Wallis Farm (CAVSARP)	14S11E CAVSARP		ACTIVE	**CA-011A**	584715	32°14'36"	111°15'6"	14	11	5	13355 W. Mile Wide Road
G4	Wallis Farm (CAVSARP)	14S11E CAVSARP		PENDING	**CA-019A**	202892	32°14'41"	111°15'26"	14	11	6	Wallis Farm
G4	Wallis Farm (CAVSARP)	14S11E CAVSARP		MONITORED	**WR-304A**	563470			14	11	5	Wallis Farm
G4	Wallis Farm (CAVSARP)	14S11E CAVSARP		MONITORED	**WR-305A**	563471			14	11	5	Wallis Farm
G4	Wallis Farm (CAVSARP)	14S11E CAVSARP		MONITORED	**WR-306A**	563472			14	11	5	Wallis Farm
G4	Wallis Farm (CAVSARP)	14S11E CAVSARP		MONITORED	**WR-306B**	563472			14	11	5	Wallis Farm
G4	Wallis Farm (CAVSARP)	14S11E CAVSARP		MONITORED	**WR-307A**	563474			14	11	8	Wallis Farm
G4	Wallis Farm (CAVSARP)	14S11E CAVSARP		MONITORED	**WR-308A**	563475			14	11	8	Wallis Farm
G4	Wallis Farm (CAVSARP)	14S11E CAVSARP		MONITORED	**WR-309A**	563473			14	11	8	Wallis Farm
G4	Wallis Farm (CAVSARP)	14S11E CAVSARP		MONITORED	**WR-309B**	563473			14	11	8	Wallis Farm
G4	Wallis Farm (CAVSARP)	14S11E CAVSARP		MONITORED	**WR-315A**	562751	32°14'36"	111°14'50"	14	11	5	14150 W. Mile Wide Road
G4	Wallis Farm (CAVSARP)	14S11E CAVSARP		MONITORED	**WR-316A**	565667	32°13'45"	111°14'38"	14	11	8	Wallis Farm

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G4	Wallis Farm (CAVSARP)	14S11E CAVSARP		MONITORED	**WR-324A**	567935			14	11	8	Wallis Farm
G4	Wallis Farm (CAVSARP)	14S11E CAVSARP		MONITORED	**WR-324B**	567935			14	11	8	Wallis Farm
G4	Wallis Farm (CAVSARP)	14S11E CAVSARP		MONITORED	**WR-324C**	567935			14	11	8	Wallis Farm
G4	Wallis Farm (CAVSARP)	14S11E CAVSARP		MONITORED	**WR-330A**	573019			14	11	8	Wallis Farm
G4	Wallis Farm (CAVSARP)	14S11E CAVSARP		MONITORED	**WR-330B**	573019			14	11	8	Wallis Farm
G4	Wallis Farm (CAVSARP)	14S11E CAVSARP		MONITORED	**WR-331A**	573020			14	11	5	Wallis Farm
G4	Wallis Farm (CAVSARP)	14S11E CAVSARP		MONITORED	**WR-331B**	573020			14	11	5	Wallis Farm
G4	Wallis Farm (CAVSARP)	14S11E CAVSARP		MONITORED	**WR-401A**	597049			14	11	8	Wallis Farm
G4	Wallis Farm (CAVSARP)	14S11E CAVSARP		MONITORED	**WR-403A**	582805			14	11	8	Wallis Farm
G4	Wallis Farm (CAVSARP)	14S11E CAVSARP		MONITORED	**WR-404A**	597051			14	11	8	Wallis Farm
G4	Wallis Farm (CAVSARP)	14S11E CAVSARP		MONITORED	**WR-405A**	597052			14	11	5	Wallis Farm
G4	Wallis Farm (CAVSARP)	14S11E CAVSARP		MONITORED	**WR-406A**	597053			14	11	5	Wallis Farm
G4	Wallis Farm (CAVSARP)	14S11E CAVSARP		MONITORED	**WR-407A**	597054			14	11	5	Wallis Farm
G4	Wallis Farm (CAVSARP)	14S11E CAVSARP		MONITORED	**WR-408A**	582806			14	11	8	Wallis Farm
G4	Wallis Farm (CAVSARP)	14S11E CAVSARP		MONITORED	**WR-409A**	597055			14	11	5	Wallis Farm
G4	Wallis Farm (CAVSARP)	14S11E CAVSARP		MONITORED	**WR-410A**	597056			14	11	5	Wallis Farm
G4	Wallis Farm (CAVSARP)	14S11E CAVSARP		MONITORED	**WR-411A**	582807			14	11	8	Wallis Farm
G4	Wallis Farm (CAVSARP)	14S11E CAVSARP		MONITORED	**WR-411B**	583987			14	11	8	Wallis Farm
G4	Wallis Farm (CAVSARP)	14S11E CAVSARP		MONITORED	**WR-412A**	591507	32°13'12"	111°14'35"	14	11	8	Wallis Farm
G4	Wallis Farm (CAVSARP)	14S11E CAVSARP		MONITORED	**WR-419A**	582811			14	11	5	Wallis Farm
G4	Wallis Farm (CAVSARP)	14S11E CAVSARP		MONITORED	**WR-419B**	583991			14	11	5	Wallis Farm
G4	Wallis Farm (CAVSARP)	14S11E CAVSARP		MONITORED	**WR-420A**	591503	32°14'50"	111°14'39"	14	11	5	Wallis Farm

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City of Tucson Well Inventory

Group	Farm	COT Well Map ID	Total # Wells	Well Type	Well #	ADWR #	LAT	LONG	T	R	S	Address
G5	Double Z. S. Farm	14S11E	6	MONITORED	**AV-015A**	620274	32°10'19"	111°13'3"	14	11	34	3865 S. Sandario Rd.
G5	Double Z. S. Farm	14S11E		ACTIVE	**AV-024A**	620170	32°9'44"	111°13'26"	14	11	33	12102 W. Snyder Hill Rd.
G5	Double Z. S. Farm	14S11E		PENDING	**AV-024B**				14	11	33	12102 W. Snyder Hill Rd.
G5	Double Z. S. Farm	14S11E			**AV-025A**							
G5	Double Z. S. Farm	14S11E		MONITORED	**AV-026A**	564420	32°9'43"	111°12'38"	14	11	34	Double Z.S. Farm
G5	Double Z. S. Farm	14S11E		PENDING	**SA-008A**				14	11	34	Double Z.S. Farm
G5	Growers Finance Farm	14S11E	23	MONITORED	**AV-013A**	620272	32°10'33"	111°14'10"	14	11	29	3798 S. Marstellar Rd.
G5	Growers Finance Farm	14S11E		ACTIVE	**AV-014A**	620273	32°10'33"	111°13'33"	14	11	28	3799 S. Marstellar Rd.
G5	Growers Finance Farm	14S11E		ACTIVE	**AV-015B**	620275	32°10'21"	111°13'3"	14	11	34	3865 S. Sandario Rd.
G5	Growers Finance Farm	14S11E		ACTIVE	**AV-016A**	620276	32°10'20"	111°12'4"	14	11	34	3810 S. Sandario Rd.
G5	Growers Finance Farm	14S11E		ACTIVE	**AV-017A**	620277	32°11'12"	111°12'4"	14	11	27	2601 S. Sandario Rd.
G5	Growers Finance Farm	14S11E		PENDING	**AV-017B**	203659			14	11	27	2601 S. Sandario Rd.
G5	Growers Finance Farm	14S11E		ACTIVE	**AV-018A**	620278	32°11'49"	111°13'2"	14	11	22	1901 S. Sandario Rd.
G5	Growers Finance Farm	14S11E		ACTIVE	**AV-019A**	620279	32°10'58"	111°13'2"	14	11	27	3201 S. Sandario Rd.
G5	Growers Finance Farm	14S11E		ACTIVE	**AV-020A**	620280	32°11'5"	111°13'57"	14	11	28	2901 S. Marstellar Rd.
G5	Growers Finance Farm	14S11E		ACTIVE	**AV-021A**	620167	32°10'39"	111°12'36"	14	11	27	3325 S. Sandario Rd.
G5	Growers Finance Farm	14S11E		ACTIVE	**AV-022A**	620168	32°10'4"	111°13'36"	14	11	33	12550 W. Snyder Hill Rd.
G5	Growers Finance Farm	14S11E		MONITORED	**CF-014A**	0	32°10'32"	111°13'32"	14	11	28	Growers Finance Farm
G5	Growers Finance Farm	14S11E		PENDING	**SA-001A**				14	11	28	Growers Finance Farm
G5	Growers Finance Farm	14S11E		PENDING	**SA-002A**				14	11	22	Growers Finance Farm
G5	Growers Finance Farm	14S11E		PENDING	**SA-004A**				14	11	32	Growers Finance Farm
G5	Growers Finance Farm	14S11E		PENDING	**SA-005A**				14	11	22	Growers Finance Farm

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City of Tucson Well Inventory

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G5	Growers Finance Farm	14S11E		PENDING	**SA-006A**				14	11	27	Growers Finance Farm
G5	Growers Finance Farm	14S11E		PENDING	**SA-007A**				14	11	29	Growers Finance Farm
G5	Growers Finance Farm	14S11E		PENDING	**SA-009A**				14	11	28	Growers Finance Farm
G5	Growers Finance Farm	14S11E		PENDING	**SA-010A**				14	11	28	Growers Finance Farm
G5	Growers Finance Farm	14S11E		MONITORED	**WR-500A**	0	32°11'23"	111°13'19"	14	11	28	Growers Finance Farm
G5	Growers Finance Farm	14S11E		MONITORED	**WR-502A**	0	32°10'57"	111°14'1"	14	11	28	Growers Finance Farm
G5	Growers Finance Farm	14S11E		MONITORED	**WR-508A**	0	32°10'34"	111°12'6"	14	11	27	Growers Finance Farm
G5	Hill Farm	15S11E	2	ACTIVE	**AV-008A**	620268	32°8'26"	111°11'6"	15	11	11	10200 W. Ajo Way
G5	Hill Farm	15S11E		ACTIVE	**AV-011A**	620270	32°8'49"	111°12'1"	15	11	11	10971 W. Park Rd.
G5	Morse Farm	14S11E	5	ACTIVE	**AV-023A**	620169	32°9'42"	111°13'57"	14	11	33	12550 W. Snyder Hill Rd.
G5	Morse Farm	14S11E		PENDING	**AV-023B**				14	11	33	12550 W. Snyder Hill Rd.
G5	Morse Farm	14S11E		PENDING	**SA-003A**				14	11	33	Growers Finance Farm
G5	Morse Farm	14S11E		MONITORED	**WR-504A**	0	32°10'20"	111°14'5"	14	11	33	Morse Farm
G5	Morse Farm	14S11E		MONITORED	**WR-506A**	0	32°9'43"	111°13'39"	14	11	33	Morse Farm
G6	Buckelew Farm	15S10E	3	MONITORED	**AF-055A**	603528	32°5'11"	111°19'58"	15	10	28	Buckelew Farm
G6	Buckelew Farm	15S10E		MONITORED	**AF-055A**	603528	32°5'11"	111°19'58"	15	10	28	Buckelew Farm
G6	Buckelew Farm	15S10E		MONITORED	**LM-001A**	0	32°4'55"	111°19'56"	15	10	33	Buckelew Farm
G6	Duval/ Penzoil Farm	16S10E	20	MONITORED	**AF-062A**	623136	32°4'10"	111°19'37"	16	10	4	Duval Farm
G6	Duval/ Penzoil Farm	16S10E		MONITORED	**AF-063A**	623137	32°3'37"	111°20'2"	16	10	5	Duval Farm
G6	Duval/ Penzoil Farm	16S10E		MONITORED	**AF-064A**	623138	32°3'11"	111°20'34"	16	10	8	Duval Farm
G6	Duval/ Penzoil Farm	16S10E		MONITORED	**AF-065A**	623140	32°2'13"	111°21'23"	16	10	18	Duval Farm
G6	Duval/ Penzoil Farm	16S10E		MONITORED	**AF-066A**	805099	32°2'13"	111°21'25"	16	10	18	Duval Farm

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City of Tucson Well Inventory

Group	Farm	COT Well Map ID	Total # Wells	Well Type	Well #	ADWR #	LAT	LONG	T	R	S	Address
G6	Duval/ Penzoil Farm	16S10E		MONITORED	**AF-072A**	623142	32°4'18"	111°19'27"	15	10	33	Duval Farm
G6	Duval/ Penzoil Farm	16S10E		MONITORED	**CF-013A**	0	32°2'44"	111°21'6"	16	10	7	Duval Farm
G6	Duval/ Penzoil Farm	16S10E		MONITORED	**WR-157A**	524425	32°3'20"	111°20'41"	16	10	8	Duval Farm
G6	Duval/ Penzoil Farm	16S10E		MONITORED	**WR-158A**	524424	32°3'16"	111°20'56"	16	10	8	Duval Farm
G6	Duval/ Penzoil Farm	16S10E		MONITORED	**WR-159A**	524428	32°3'17"	111°20'44"	16	10	8	Duval Farm
G6	Duval/ Penzoil Farm	16S10E		MONITORED	**WR-159B**	524428						
G6	Duval/ Penzoil Farm	16S10E		MONITORED	**WR-160A**	524423	32°3'19"	111°20'48"	16	10	8	Duval Farm
G6	Duval/ Penzoil Farm	16S10E		MONITORED	**WR-160B**	524423			16	10	8	Duval Farm
G6	Duval/ Penzoil Farm	16S10E		MONITORED	**WR-160C**	524423			16	10	8	Duval Farm
G6	Duval/ Penzoil Farm	16S10E		MONITORED	**WR-166A**	525786			16	10	8	Duval Farm
G6	Duval/ Penzoil Farm	16S10E		MONITORED	**WR-167A**	525164			16	10	8	Duval Farm
G6	Duval/ Penzoil Farm	16S10E		MONITORED	**WR-168A**	525787			16	10	8	Duval Farm
G6	Duval/ Penzoil Farm	16S10E		MONITORED	**WR-169A**	525165			16	10	8	Duval Farm
G6	Duval/ Penzoil Farm	16S10E		MONITORED	**WR-170A**	525167			16	10	8	Duval Farm
G6	Duval/ Penzoil Farm	16S10E		MONITORED	**WR-171A**	525166			16	10	8	Duval Farm

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Edaphic Conditions and Water Sources (App A)

Group	Farm	Soils	Water Sources	Washes/Condition	FEMA-100 yr flood	Irrigated Acres	Last Irrigated	Earth Works/Irrigation Structures
G1	Hurst Farm	Deep alluvial farmed.	No permanent water sources.	Flood plain of Los Robles Wash, which transects Eastern portion of parcel from SE to NW.	Partially	296	12/1/1975	
G1	Martin Farm	Deep alluvium: sand and sandy loam.				184	8/1/1983	
G1	Santa Cruz Farm	Deep alluvial: Gravelly sandy loam, sandy loam, loamy sand and silty clay loam. Entirely disturbed by agricultural activities, earth moving, and flooding. . Land is generally flat except where bermed or excavated.			Partially	910	9/1/1986	
G1	Simpson Farm North	Deep alluvial: Generally sandy or gravelly in structure.	Approx. 1.2 miles of effluent-dominated Santa Cruz River. Water is not permanent, consistent, or assured, but is present in sufficient amount to support a well-developed riparian community of plants and animals. No other permanent or ephemeral water source.		Partially	209A, 12/77		Several ditches and flood control structures (berms) are present and affect drainage and water flow across the parcel.
G1	Simpson Farm South	Previously farmed, deep alluvial.	No permanent surface water.		Partially			
G2	CHU Farm	Deep alluvium: sand and sandy loam.				294	9/1/1984	
G2	Comiskey Farm	Deep alluvium: sand and sandy loam.	No permanent surface water detected.		Entire	371	12/1/1974	Cement lined ditches border and cross parcel and a major drainage ditch bisects the approx. center of the parcel. Road berm.
G2	Gin Farm	Deep alluvium: sand and sandy loam.	No permanent or ephemeral water available on parcel.		Partially	437	12/1/1975	Several ditches and flood control berms are present and affect drainage and water flow across the parcel.

Edaphic Conditions and Water Sources (App A)

Group	Farm	Soils	Water Sources	Washes/Condition	FEMA-100 yr flood	Irrigated Acres	Last Irrigated	Earth Works/Irrigation Structures
G2	James Glover Farm	Deep alluvium: sand and sandy loam.	No permanent surface water.		Entire	159	12/1/1976	Several ditches and flood control berms are present and affect drainage and water flow across the parcel.
G2	Levkowitz Farm	Deep alluvium: sand and sandy loam.	No permanent surface water detected.		Entire	152	12/1/1959	Cement lined ditches border and cross parcel and a major drainage ditch bisects the approx. center of the parcel. Road berm.
G2	Lupori Farm	Deep alluvium: sand and sandy loam.				320	9/1/1985	
G2	Reeves Farm North	Deep alluvium: sand and sandy loam.				277 N&S	9/1/1984	
G2	Reeves Farm South	Deep alluvium: sand and sandy loam.				277 N&S	9/1/1984	
G2	Weinstein Farm	Deep alluvium: sand and sandy loam.	No permanent surface water detected. Agricultural runoff water from the field to the south drains across the property, mostly into a narrow channel that terminates in a temporary pond.		Partially	92	12/1/1975	Cement lined ditches are present along the east side of the parcel.
G3	Anway Farm	Soils are deep alluvium; sand and sandy loam.	No permanent surface water. Portions not in designated floodplain appear to have been flooded/ Fine silty topsoil over much of parcel suggests periodic flooding. The SW 1/4 has very sandy soil		NE corner	235	12/1/1977	
G3	Edward Anway Farm	Deep alluvium: sand and sandy loam.	No permanent surface water.		The west 1/2	469	12/1/1976	
G3	Flying “E” Bar Farm	Deep alluvium: sand and sandy loam.	No permanent water available on parcel		Partially	660	12/1/1972	

Edaphic Conditions and Water Sources (App A)

Group	Farm	Soils	Water Sources	Washes/Condition	FEMA-100 yr flood	Irrigated Acres	Last Irrigated	Earth Works/Irrigation Structures
G3	John Kai Farms (AKA Hughes-Kai Farm)	Deep alluvium: sand and sandy loam.	No permanent surface water.		Most of the parcel			
G3	Tucker Farm	Deep alluvium: sand and sandy loam.	No permanent surface water.			608.23	2/1/1985	
G4	98 Farm	Deep alluvial farmed. Land is flat with slight downward slope to the north (less than 1%). Most of the land has been disturbed either by irrigated agriculture, off-road vehicle activity, earth moving, berm construction, or wash channeling.	Open water is present in recharge basins that are filled periodically and allowed to dry. Wash channeling present. Roads, ditches and berms block sheetflow across the parcel resulting in impoundments, most of which are short-lived. In Sec. 8 an impoundment is a long lived temporary pond that is used by livestock and wildlife.		Most of the parcel	263A 12/76		Dozens of cement lined ditches cross the property, dividing it into many fields. Roads, ditches and berms block sheetflow across the parcel.
G4	Bowden Farm	Deep alluvial farmed. Land is flat with slight downward slope to the north (less than 1%). Most of the land has been disturbed either by irrigated agriculture, off-road vehicle activity, earth moving, berm construction, or wash channeling.	Open water is present in recharge basins that are filled periodically and allowed to dry. Wash channeling present. Roads, ditches and berms block sheetflow across the parcel resulting in impoundments, most of which are short-lived. In Sec. 8 an impoundment is a long lived temporary pond that is used by livestock and wildlife.	The portion of Brawley Wash that crossed the parcel has been channelized and bermed for flood control, with most of the original vegetation removed.	Most of the parcel	640A, 12/76		Dozens of cement lined ditches cross the property, dividing it into many fields. Roads, ditches and berms block sheetflow across the parcel.
G4	Cactus Co.- Avra Farm	Deep alluvial farmed. Include some sandy areas surrounded by loamy soils.	No open water present.			1540	12/1/1977	

Edaphic Conditions and Water Sources (App A)

Group	Farm	Soils	Water Sources	Washes/Condition	FEMA-100 yr flood	Irrigated Acres	Last Irrigated	Earth Works/Irrigation Structures
G4	Cactus Co.-Milewide Farm	Deep alluvial farmed. Land is flat with slight downward slope to the north (less than 1%). Most of the land has been disturbed either by irrigated agriculture, off-road vehicle activity, earth moving, berm construction, or wash channeling.	Open water is present in recharge basins that are filled periodically and allowed to dry. Wash channeling present. Roads, ditches and berms block sheetflow across the parcel resulting in impoundments, most of which are short-lived. In Sec. 8 an impoundment is a long lived temporary pond that is used by livestock and wildlife.	The portion of Brawley Wash that crossed the parcel has been channelized and bermed for flood control, with most of the original vegetation removed.	Most of the parcel	1287	12/1/1977	Dozens of cement lined ditches cross the property, dividing it into many fields. Roads, ditches and berms block sheetflow across the parcel.
G4	Davison Farm	Deep alluvial farmed. Land is flat with slight downward slope to the north (less than 1%). Most of the land has been disturbed either by irrigated agriculture, off-road vehicle activity, earth moving, berm construction, or wash channeling.	Open water is present in recharge basins that are filled periodically and allowed to dry. Wash channeling present. Roads, ditches and berms block sheetflow across the parcel resulting in impoundments, most of which are short-lived. In Sec. 8 an impoundment is a long lived temporary pond that is used by livestock and wildlife.	The portion of Brawley Wash that crossed the parcel has been channelized and bermed for flood control, with most of the original vegetation removed.	Most of the parcel	628		Dozens of cement lined ditches cross the property, dividing it into many fields. Roads, ditches and berms block sheetflow across the parcel.
G4	Jarvis Farm North	The site is essentially flat. Soils are deep alluvium with an overlay of fine material deposited by flood.				663	2/1/1985	
G4	Jarvis Farm South	Deep alluvial farmed. Land is flat with slight downward slope to the north (less than 1%). Most of the land has been disturbed either by irrigated agriculture, off-road vehicle activity, earth moving, berm construction, or wash channeling.	Open water is present in recharge basins that are filled periodically and allowed to dry. Wash channeling present. Roads, ditches and berms block sheetflow across the parcel resulting in impoundments, most of which are short-lived. In Sec. 8 an impoundment is a long lived temporary pond that is used by livestock and wildlife.	The portion of Brawley Wash that crossed the parcel has been channelized and bermed for flood control, with most of the original vegetation removed.	Most of the parcel			Dozens of cement lined ditches cross the property, dividing it into many fields. Roads, ditches and berms block sheetflow across the parcel.

Edaphic Conditions and Water Sources (App A)

Group	Farm	Soils	Water Sources	Washes/Condition	FEMA-100 yr flood	Irrigated Acres	Last Irrigated	Earth Works/Irrigation Structures
G4	Nichols Farm	Deep alluvial farmed. The land is flat, with a slight downward slope to the northeast (less than 1%)				772	9/1/1984	
G4	Trust No. 205	Deep alluvium: sand and sandy loam. Sandy soils that have apparently not been subject to irrigated farming.	No open water is present. Apparently has not been subject to irrigation. Appears portions have been flooded repeatedly.		NE 1/2 of parcel	261	12/1/1962	
G4	Wallis Farm	Deep alluvial farmed. Land is flat with slight downward slope to the north (less than 1%). Most of the land has been disturbed either by irrigated agriculture, off-road vehicle activity, earth moving, berm construction, or wash channeling.	Open water is present in recharge basins that are filled periodically and allowed to dry. Wash channeling present. Roads, ditches and berms block sheetflow across the parcel resulting in impoundments, most of which are short-lived. In Sec. 8 an impoundment is a long lived temporary pond that is used by livestock and wildlife.	The portion of Brawley Wash that crossed the parcel has been channelized and bermed for flood control, with most of the original vegetation removed.	Most of the parcel	811	12/1/1976	Roads, ditches and berms block sheetflow across the parcel.
G5	Double Z. S. Farm	Deep alluvial farmed. Essentially all land has been disturbed, either by irrigated agriculture, off road vehicle activity, earth-moving, berm construction or wash channeling.	No permanent or ephemeral water available on parcel.	The portion of the Black Wash that crosses the parcel has been channelized and is now a drainage ditch.		496	12/1/1975	Dozens of cement-lined ditches cross the property, dividing it into many fields. Roads, ditches, and berms block sheetflow across the parcel, and result in impoundments, most of which are short-lived.
G5	Growers Finance Farm	Deep alluvial farmed. Essentially all land has been disturbed, either by irrigated agriculture, off road vehicle activity, earth-moving, berm construction or wash channeling.	No permanent or ephemeral water available on parcel.	The portion of the Black Wash that crosses the parcel has been channelized and is now a drainage ditch.	Entire	1428	12/1/1972	Dozens of cement-lined ditches cross the property, dividing it into many fields. Roads, ditches, and berms block sheetflow across the parcel, and result in impoundments, most of which are short-lived.

Edaphic Conditions and Water Sources (App A)

Group	Farm	Soils	Water Sources	Washes/Condition	FEMA-100 yr flood	Irrigated Acres	Last Irrigated	Earth Works/Irrigation Structures
G5	Hill Farm	Deep alluvial, most of which has been disturbed by earth moving equipment to create Ryan Field, or retired farmland. Some is generally undisturbed.	No permanent water available on parcel.	Small washes have been cut across and redirected at several points on the parcel.		307	12/1/1970	Several ditches and flood control structures (berms) are present and affect drainage and water flow across the parcel.
G5	Morse Farm	Deep alluvial farmed. Essentially all land has been disturbed, either by irrigated agriculture, off road vehicle activity, earth-moving, berm construction or wash channeling.	No permanent or ephemeral water available on parcel.	The portion of the Black Wash that crosses the parcel has been channelized and is now a drainage ditch.	Entire	100	2/1/1985	Dozens of cement-lined ditches cross the property, dividing it into many fields. Roads, ditches, and berms block sheetflow across the parcel, and result in impoundments, most of which are short-lived.
G6	Buckelew Farm	Mostly or silty loams. Soils South half of Sec.21 and all of Sec. 28, 33 has been farmed. The remainder of Sec 21 and all of Sec 22 has intact native soil, which has been subject to grazing and flooding. Terrain generally flat with some gently rolling ridges in Sec. 21, 22.				1540	9/1/1984	
G6	Duval/ Penzoil Farm	Soils are very sandy and fine-grained, eroding, with little organic horizon. Slope is generally less than 3%.				549		

Condition of Habitat, Vegetation, and Riparian Areas (APP A)

Group	Farm	General Condition/ Vegetation	Condition/Location of Riparian Areas	Current Vegetation-General/ Association/ Dominant Species/ Acres/ % of Parcel	Mitigation Value
G1	Hurst Farm	NE 30% of parcel is undisturbed except for a couple of undeveloped dirt roads and disturbances associated with a former residence. Brawley Wash runs SE to NW through the parcel. It was channelized and bermed to protect the agricultural fields to the W from flooding. Consequently the row of mesquites associated with the wash is only about 100' wide. Majority of the W portion of the parcel, approx. 60% is retired agricultural land. Approx. 10% of the N portion was not cultivated and is vegetated with dense mesquite. Water apparently impounds here, further increasing water availability for mesquite growth.	Harris Riparian Vegetation Map Classification: Many mesquites greater than 6" in diameter at 4.5' above ground level. Under story vegetation is not well developed. the mesquite vegetation at the northern end of the parcel is dense. Outside CFPO or a recovery Area and the PPC range. The parcel is bisected by Los Robles Wash which is considered "Class II Wildlife Habitat" (Shaw et al). Classified as "Important Riparian Area" (Draft SDCP). Potential mitigation possibility for CFPO travel corridor.	Open Space River: 154.10 Sonoran Desertscrub Xeroriparian, Mesquite 52A 11%. Open Space Undisturbed: 154.11 Sonoran Desertscrub, creosote bush, 120A 26%. Agricultural Land Out of Production: 364.1Sonoran Vacant or Fallow Land, Mesquite (as shrub), Russian thistle 294A 63%	Yes
G1	Martin Farm	Parcel is bisected by the Santa Cruz River flowing SE to NW. Vegetation is in poor condition due to past flooding and continued grazing. Nonnative salt cedar and Athel tamarisk are present. Large dead mesquites in SW corner. Vegetation in fallow fields impacted by grazing. Shows little sign of recovery. Weedy and sparse. Because of the steeply incised condition of the river and the intermittent nature of the water, it is unlikely that vegetation conditions will improve without significant effort. Vegetation conditions are exacerbated by the presence of cattle.	Harris Riparian Vegetation Map Classification: 234.700 Sonoran Deciduous Riparian Scrub, 224.52 Mesquite. Outside CFPO and PPC range. Segments are considered "Class I or Class II wildlife Habitat" (Shaw et al). South 2/3 of parcel classified "Important Riparian Area" of Biological Core" (SDCP). North 1/3 not classified.	Open Space Undisturbed: 154.1 Sonoran Desertscrub, Creosote bush 10A 4%; Open Space River 224.52 Mesquite (as tree) 37A 15%; Open Space River 234.7 Sonoran Deciduous Riparian Scrub, Burro brush 11A 5%; Agricultural Land Out of Production 364.1 Sonoran Vacant Land or Mesquite (as shrub), Russian thistle 184A 76%	Priority Conservation Area
G1	Santa Cruz Farm	100% Mesquite, Russian Thistle, grasses and forbs. Vegetation is sparse and consists mostly on non-native weedy species.	No potential suitable habitat of any Federal listed threatened or endangered species. Bisected by Brawley Wash a "Class I and II Wildlife Habitat". West: Proposed CFPO Recovery Area; West: Bordered by proposed CFPO Recovery Area.	Agricultural land out of production: 364.1 Sonoran fallow or vacant land, Mesquite (as shrub), desert broom, Russian thistle, grasses and forbs 1158A 100%	Little mitigation or conservation value potential.

Condition of Habitat, Vegetation, and Riparian Areas (APP A)

Group	Farm	General Condition/ Vegetation	Condition/Location of Riparian Areas	Current Vegetation-General/ Association/ Dominant Species/ Acres/ % of Parcel	Mitigation Value
G1	Simpson Farm North	2% 8 acres Fremont Cottonwood, Gooding Willow; 6%, 19 acres Burro Brush; 92% 297acres Mesquite, Russian Thistle	Managed by TAS as a model of habitat restoration methods. Approx. 70 acres have received restoration methods: seeding of native plants, water harvesting, and removal of nonnative plants. Prevailing drought conditions have limited growth of plants in restoration areas. The presence of effluent water, riparian vegetation has developed along the river including cottonwood and willow. Potential habitat for CFPOS; SDCP "Important Riparian Habitat" and "Biological Core" based on future potential conditions. Outside PPC range. Segments on the river are considered "Class I or Class II Wildlife Habitat" (Shaw et al).	Open Space River: 224.53 Cottonwood-willow, Fremont cottonwood-Gooding Willow 8A 2%; 234.7 Sonoran Deciduous Riparian Scrub, Burro brush 19A 6%; agricultural Land Out of Production, 364.1 Sonoran Vacant or Fallow Land, Mesquite (as shrub), Russian thistle 297A 92%	Priority Conservation Area
G1	Simpson Farm South	The western most 60% of the parcel is undisturbed except for dirt roads and Silverbell Rd, which bisects the parcel. The remainder is retired agricultural land. No saguaros and few mesquites. Some mesquites occur along the western edge of Silverbell Road where water has impounded. Under story vegetation is not well developed.	Outside CFPO and PPC range. Most of parcel designated "Multiple Use" with the exception of the SW corner designated as "Important Riparian".	Open Space Undisturbed: 154.11 Sonoran Desertscrub, creosote bush 203A 65%; Agricultural Land Out of Production: 364.1 Sonoran Vacant or Fallow Land, Weedy grasses and forbs 111A 35%	Little mitigation potential
G2	Chu Farm	Sparsely vegetated open fields.	Harris Riparian Vegetation Map: No riparian vegetation.	Agricultural land out of production: 364.1 Sonoran fallow or vacant land, Mesquite (as shrub), and annual weeds 302 A 100%	No mitigation value
G2	Comiskey Farm	GROUPED WITH LEVKOWITZ FARM. Most of parcel: sparsely vegetated open fields that have had multiple impacts of dumping refuse and off road vehicle use. Sheetflow is interrupted by berms and ditches. The natural condition of the land cannot be discerned because of multiple direct and indirect impacts. Appears to have been flooded repeatedly and also disturbed by earth moving and vehicle activity. Blockage of ditch by a road berm has resulted in ponding and high soil moisture.	Some of the riparian vegetation consisting of 224.52 Sonoran Riparian Forest and Woodland, Mesquite series and some as 154.10, Sonoran Desertscrub Xeroriparian. The larger mesquites are in the area where water ponds. Most if not all of the land indicated as having 154.10 Sonoran Desertscrub Xeroriparian by Harris is actually 364.1 Sonoran Vacant or Fallow land that has had second growth mesquite. The parcel does not currently provide suitable habitat for any Federal listed threatened or endangered species. Brawley Wash runs through the Western side of the parcel.	Harris Riparian Vegetation Map Classification: Open Space Undisturbed: 224.52 Sonoran Riparian Forest and Woodland, Mesquite (as tree) 90A 14%. Agricultural Land Out of Production: 364.1 Sonoran Vacant or Fallow Land, Mesquite (as shrub) and annual weeds 558A 86%	The parcel shows some potential mitigation value in the context of management of Brawley Wash as a riparian corridor.

Condition of Habitat, Vegetation, and Riparian Areas (APP A)

Group	Farm	General Condition/ Vegetation	Condition/Location of Riparian Areas	Current Vegetation-General/ Association/ Dominant Species/ Acres/ % of Parcel	Mitigation Value
G2	Gin Farm	Vegetation is generally sparse; mostly weedy species.	Harris Riparian Vegetation Map Classification: A small strip of 154.10 Sonoran Desertscrub riparian vegetation along the S boundary of the parcel in Sec. 11 and in the NW corner of the parcel in Sec. 11. Growth of mesquite has been facilitated by berms and raised roads. With the exception of these mesquite areas, the entire parcel is fallow agricultural land with little vegetation growth. The NW corner contains some mesquite dominated xeroriparian vegetation associated with Brawley Wash and a slender strip of the same type of vegetation is created by conditions resulting from a raised road at the S boundary in Sec. 11. Outside of CFPO Recovery Area and PPC range. The Brawley Wash segment is considered "Class I or Class II Wildlife Habitat" (Shaw et al). The mesquite dominated vegetation is classified as "Important Riparian Area" and the remainder as "Multiple Use"(SDCP). The SDCP maps this parcel as containing Priority Conservation Areas.	Open Space Undisturbed: 154.10 Sonoran Desertscrub Xeroriarian, Mesquite 128A 17%. Agricultural Land Out of Production: 364.1 Sonoran Vacant or Fallow Land, Mesquite (as shrub) 597A 83%	No mitigation value
G2	James Glover Farm	Vegetation is generally sparse; mostly weedy species.	Harris Riparian Vegetation Map Classification: 154.1000 Sonoran Desertscrub xeroriparian vegetation at the SW corner. Largely a result of a raised berm flood control structure that causes ponding of water. Outside CFPO Recovery area and PPC range. Mesquite dominated vegetation classified as "Important Riparian Area" (Draft SDCP). Conditions suggest that it would be of mitigation or restoration value.	Open Space Undisturbed: 154.10 Sonoran Desertscrub Xeroriarian, Mesquite 30A 17%. Agricultural Land Out of Production: 364.1 Sonoran Vacant or Fallow Land, Mesquite (as shrub), Russian Thistle 150A 83%	No mitigation value
G2	Levkowitz Farm	INFO FOR THIS FARM GROUPED WITH COMISKY FARM			Some

Condition of Habitat, Vegetation, and Riparian Areas (APP A)

Group	Farm	General Condition/ Vegetation	Condition/Location of Riparian Areas	Current Vegetation-General/ Association/ Dominant Species/ Acres/ % of Parcel	Mitigation Value
G2	Lupori Farm	GROUPED WITH REEVES FARM NORTH. Most of this parcel consists of sparsely vegetated open fields with areas of dense mesquite developing behind barriers to sheetflow. The dense mesquites along the eastern edge of the parcel are similar to those along Brawley Wash, and the parcel was probably originally part of the Brawley Wash corridor.	Harris Riparian Vegetation Map: Riparian vegetation classified as 154.1000 Sonoran Desertscrub. Outside CFPO and PPC range. Upland portions of the parcel are indicated as "Multiple Use" and the xeroriparian areas are indicated as "Important Riparian Areas" (SDCP).	Open Space Undisturbed: 154.1 Sonoran Desertscrub Xeroriarian, Mesquite 10A 2%. Agricultural Land Out of Production: 364.1 Sonoran Vacant or Fallow Land, Mesquite 10A 2%	Potential mitigation value. Priority Conservation Area
G2	Reeves Farm North	GROUPED WITH LUPORI FARM. Most of this parcel consists of sparsely vegetated open fields with areas of dense mesquite developing behind barriers to sheetflow. The dense mesquites along the eastern edge of the parcel are similar to those along Brawley Wash, and the parcel was probably originally part of the Brawley Wash corridor.	Harris Riparian Vegetation Map: Riparian vegetation classified as 154.1000 Sonoran Desertscrub. Outside CFPO and PPC range. Upland portions of the parcel are indicated as "Multiple Use" and the xeroriparian areas are indicated as "Important Riparian Areas" (SDCP).	Open Space Undisturbed: 154.1 Sonoran Desertscrub Xeroriarian, Mesquite 10A 2%. Agricultural Land Out of Production: 364.1 Sonoran Vacant or Fallow Land, Mesquite 10A 2%	Potential mitigation value. Priority Conservation Area
G2	Reeves Farm South	Parcel is undisturbed except for a north to south road running through the eastern portion. A wash floodplain runs southeast to northwest through the central portion. Wash vegetation is characterized by mesquite stringers and barren, silty flats. The floodplain is bordered by an upland creosote bush-mixed association to the north and by an upland saltbush=bursage association with scattered patches of creosote bush to the south. There is a breached earthen dike at the northern end of the parcel.	Harris Riparian Vegetation Map: Riparian vegetation classified as 154.11 Sonoran Desertscrub. Outside CFPO and PPC range. Central wash designated as "Class II habitat (Shaw et al). "Multiple Use" and "Important Riparian Area" (SDCP).	Open Space Undisturbed: 154.1 Sonoran Desertscrub Xeroriparian, Mesquite 31A 7%; Open Space Undisturbed: 154.11 Sonoran Desertscrub, Creosote bush and saltbush 409A 93%	The parcel shows some potential mitigation value in the context of management of Brawley Wash as a riparian corridor.
G2	Weinstein Farm		Harris Riparian Vegetation Map Classification: 154.1000 Sonoran Desertscrub. Out of CFPO Recovery Area. Shows no conditions that suggest that it would be of mitigation or restoration value for species currently listed under the Endangered Species Act.	Open Space Undisturbed: 154.1 Sonoran Desertscrub Xeroriarian, Mesquite 67A 48%. Agricultural Land Out of Production: 364.1 Sonoran Vacant or Fallow Land, Mesquite 72A 52%	No mitigation value

Condition of Habitat, Vegetation, and Riparian Areas (APP A)

Group	Farm	General Condition/ Vegetation	Condition/Location of Riparian Areas	Current Vegetation-General/ Association/ Dominant Species/ Acres/ % of Parcel	Mitigation Value
G3	Anway Farm	Majority of the parcel is sparsely vegetated with scattered shrubby mesquites. Little or no woody perennial under story vegetation developed anywhere. Irrigation runoff has enhanced mesquite growth in the SE portion. The canal along the southeastern boundary supports a dense linear mesquite woodland with abundant desert broom. Water running out of the canal near the SE corner of the parcel proceeds in a NW direction as sheet flow, supporting a larger parch of mesquite woodland. Intermixed in this parch are a few large Mexican Paloverdes. Many of the Mesquites and the Mexican Paloverdes are greater than 6" diameter at 4.5 feet above ground.	Harris Riparian Vegetation Map 224.52 Sonoran Riparian Forest and Woodland. Outside CFPO Recovery area and PPC range. The mesquite lined drainage classified as "Class II" (Shaw et al). "Multiple Use" or "Recovery Management Area".	Agricultural land out of production: 224.52 Sonoran Riparian Forest and Woodland, Mesquite (as tree) 28A 10%; 364.1 Sonoran Vacant or Fallow Land, Mesquite (as shrub), burroweed, and grasses, 266A 90%	Yes. Priority Conservation Area
G3	Edward Anway Farm	Western 1/4 undisturbed mixed scrub, except for the southern end, which supports a dense mesquite woodland association. The undisturbed western portion is bordered to the E by a bermed wash, which supports a dense linear mesquite-mixed scrub association (whitethorn acacia and desert broom). The E 3/4 of the parcel is former agricultural land, with the S 1/2 less recovered than the N 1/2. The S 1/2 is largely barren with scattered (low density) shrubby mesquites and abundant weeds. The N 1/2 supports a medium density of shrubby mesquites, except at the N end along Tucker Rd where impounded water has enhanced conditions. SW corner exhibits a woodland patch wit Mesquite greater than 6" diameter at 4.5' above ground. Little or no woody perennial under story vegetation anywhere on the parcel.	Harris Riparian Vegetation Map Classification: 154.1000 Sonoran Desertscrub. Birds noted in the SW corner include Bell's vireo and Ash-throated flycatchers. Outside CFPO Recovery Area and PPC range. Mesquite lined drainage is Class II Habitat (Shaw et al). Outside of Tucson Storm water Management Study Natural Riparian Habitat Inventory. Indicated as "Multiple Use or Recovery Management Area". Mitigation potential as CFPO travel corridor.	Open Space River: 154.10 Sonoran Desertscrub Xeroriparian, Mesquite 27A 4%. Open Space Undisturbed: 154.11 Sonoran Desertscrub, Creosote bush 164A 26%. Agricultural Land Out of Production: 264.1 Sonoran Vacant or Fallow Land, Mesquite (as shrub), burroweed, and grasses 449A 70%	Yes

Condition of Habitat, Vegetation, and Riparian Areas (APP A)

Group	Farm	General Condition/ Vegetation	Condition/Location of Riparian Areas	Current Vegetation-General/ Association/ Dominant Species/ Acres/ % of Parcel	Mitigation Value
G3	Flying "E" Bar Farm	Consists of fallow agricultural land, with sparse vegetation consisting of a mixture of native and non-native species, areas of native vegetation that have been flooded, and areas of mesquite have grown where flood waters are retained. Present at the NE corner and the SE corner there are small areas of vegetation that appear to be relatively undisturbed.	Harris Riparian Vegetation map shows Riparian Habitat is classified as 154.1000 Sonoran Desertscrub. This parcel shows no conditions that suggest it would be of mitigation or restoration value. Although conditions resemble those present in sites known to have burrowing owls. It will probably never recover naturally to a condition that might provide suitable vegetation for a movement corridor for CFPO	Open Space Undisturbed: 154.1 Sonoran Desertscrub Xeroriparian, Mesquite 31A 4%. Open Space Undisturbed: 154.11 Sonoran Desertscrub, Mesquite and creosote bush 60A 9%. 364.1 Agricultural Land Out of Production, Sonoran Vacant or Fallow Land, Mesquite (as shrub), burroweed and grasses 671A 85%	No mitigation value.
G3	John Kai Farms (AKA Hughes-Kai Farm)	Fallow agricultural land, with sparse vegetation; mixture of native and non-native species.	Harris Riparian Vegetation Map Classification: No riparian vegetation on this parcel. Outside CFPO Recovery area and PPC range. No portion is Class 1 or Class 2 habitat (Shaw et al). Outside Tucson Storm water Management Study Natural Riparian Habitat Inventory range. Draft SDCP indicates parcel as Multiple Use or Recovery Mangement Area. SDCP maps parcel as Priority Conservation Area for Burrowing Owl.	Agricultural Land Out of Production: 364.1Sonoran Vacant or Fallow Land, Mesquite (as shrub), burroweed, and grasses, 639A 100%	No mitigation value.
G3	Tucker Farm	Entirely fallow agricultural land, with sparse vegetation consisting of a mixture of native and nonnative species.	Outside CFPO and PPC range. "Multiple Use" "Recovery Management Area" (SDCP).	Agricultural Land Out of Production: 364.1Sonoran Vacant or Fallow Land, Mesquite (as shrub), burroweed, and grasses, 608A 100%	No mitigation value. Priority Conservation Area
G4	98 Farm	GROUPED WITH CLEARWATER PROJECT FARMS. SEE DAVISON FARM.			SOME
G4	Bowden Farm	Entire parcel consists of fallow agricultural fields with grasses and shrubs. No large trees or areas of mature native vegetation. No undisturbed natural vegetation on this parcel. There are a few mesquites present in an area that is part of Brawley wash. The Northwest 1/2 of the northeast 1/4 of section 13 is designated as Multiple Use.	The Harris Vegetation map shows a tiny portion of the NE corner of this parcel as 224.52 Mesquite and 154.10 Sonoran Desert Scrub Xeroriparian. Hypothetical potential: The Northwest 1/2 of the northeast 1/4 of section 13 is designated as "Multiple Use Area".	Agricultural Land Out of Production: 364.1Sonoran Vacant or Fallow Land, Mesquite (as shrub), desert broom, Russian Thistle, mixed grasses 710 A 100%	No mitigation value. Priority Conservation Areas

Condition of Habitat, Vegetation, and Riparian Areas (APP A)

Group	Farm	General Condition/ Vegetation	Condition/Location of Riparian Areas	Current Vegetation-General/ Association/ Dominant Species/ Acres/ % of Parcel	Mitigation Value
G4	Cactus Co.- Avra Farm	Entire parcel fallow agricultural fields with grasses and shrubs and some scattered mesquites approx.10'. No undisturbed natural vegetation.	Harris Riparian Vegetation Map shows no riparian vegetation on this parcel. SDCP maps this parcel as containing Priority Conservation Areas. Outside CFPO Recovery Areas and Special management areas and PPC range. Indicated as" Multiple Use" (Draft SDCP).	Agricultural land out of production: 364.1 Sonoran fallow or vacant land, Mesquite (as shrub), desert broom, Russian thistle, mixed grasses 1604A 100%	No mitigation value. Priority Conservation Area
G4	Cactus Co.- Milewide Farm	GROUPED WITH CLEARWATER PROJECT FARMS. SEE DAVISON FARM.			SOME
G4	Davison Farm	GROUPED WITH CLEARWATER PROJECT FARMS. Former agricultural land with the exception of approx. 160 acres in the NE portion of Sec. 5 which has been impacted by off-road vehicle activity, trash dumping, earth moving, and flooding. Unimproved roads and concrete irrigation channels throughout. Tucson Water constructed two 20-acre recharge basins, one in Sec. 5 and one in Sec. 8. A third basin was constructed in Sec. 31. Natural re-establishment of vegetation varies within the area consisting of small shrubs, weedy grasses and forbs. Mesquite occur throughout much of the project area typically small, 6" in diameter 15 ' tall. Mesquite and other native woody perennial species, including whitethorn acacia, creosote bush, and triangle-leaf bursage are most abundant at the following general locations: Brawley Wash, the area NE of Brawley Wash in Sec.5, the S 1/2 of Sec. 6, and the N portions of Sec. 7, 8. An estimated 2-5% of the mesquites in these areas are 6" in diameter at breast height. No ironwoods and very few paloverdes.	Harris Riparian Vegetation Map Classification: 224.52 Mesquite in Sec.. 5, 6, 8 and 154.1000 Sonoran Desertscrub Xeroriparian in Sec. 4, 5, 8, 9, 24, 30. However, actual condition of vegetation does not support this designation. These are minimal quality areas with mesquite growing along artificial drainage ways and in old fields.	Agricultural Land Out of Production: 364.1Sonoran Vacant or Fallow Land, Mesquite (as shrub), desert broom, Russian Thistle, mixed grasses 4539A 100%	SOME

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Group	Farm	General Condition/ Vegetation	Condition/Location of Riparian Areas	Current Vegetation-General/ Association/ Dominant Species/ Acres/ % of Parcel	Mitigation Value
G4	Davison Farm cont.	Four saguaros observed: two in NE 1/4 Sec 5, and two in the NW 1/4 Sec. 8. A large drainage ditch runs along the W side of Sec. 6, 31 30. W portions of Sec. 30, 31 is a large (several acres) elevated (15-20') soil storage area supporting a vegetation community dominated by shrubby mesquite, whitethorn acacia, and four wing saltbush.			
G4	Jarvis Farm North	Hydrology, soils and vegetation have been greatly impacted by flooding and human activities. An abandoned ditch and berm bisect Section 11 from N to S, and this parcel lies to the E of these structures. Entire parcel appears to have been flooded repeatedly by impounded floodwaters of Brawley Wash, from the ditch eastward across and beyond the parcel. Most of the soil surface is bare of vegetation and covered with very fine clay soil. There are many small dead mesquites. There are no roads on the parcel, but it has been used by off-road vehicles and there are several piles of trash. Along Brawley Wash, on the eastern side of the parcel there is a fairly intact corridor of riparian vegetation with large mesquites and a few ironwoods. Some of the trees have been cut.	Harris Riparian Vegetation Map shows the riparian vegetation is classified as 154.1000 Sonoran Desertscrub and 224.52 Mesquite. Outside CFPO Recovery Areas and PPC range.	Open Space Undisturbed: 154.10 Sonoran Desertscrub Xeroriarian, Mesquite 193A 40%; Open Space Undisturbed: 154.11 Sonoran Desertscrub, Creosote bush and saltbush 216A 45%; Open Space River: 224.52, Mesquite 72A 15%	Partially
G4	Jarvis Farm South	GROUPED WITH CLEARWATER PROJECT FARMS. SEE DAVISON FARM.			
G4	Nichols Farm	Entire parcel consists of fallow agricultural fields with grasses and shrubs. No large trees or areas of mature native vegetation.	Harris Riparian Vegetation Map Classification: A narrow strip of 154.10 Sonoran Desertscrub Xeroriparian along the E boundary in Sec. 11 and 14 consisting of mesquite and desert broom growing along a ditch. This strip only designated as "Important Riparian Area". There is no undisturbed xeroriparian vegetation.	Agricultural Land Out of Production: 364.1Sonoran Vacant or Fallow Land, Mesquite (as shrub), desert broom, Russian Thistle, mixed grasses 792A 100%	No mitigation value.

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Group	Farm	General Condition/ Vegetation	Condition/Location of Riparian Areas	Current Vegetation-General/ Association/ Dominant Species/ Acres/ % of Parcel	Mitigation Value
G4	Trust No. 205	Protection of the washes and mesquites might add to the ecological value of The Brawley Wash corridor. It might also have value as an addition to Ironwood Forest National Monument.	Harris Riparian Vegetation Map Classification: Riparian vegetation as 154.10 Sonoran Desertscrub Xeroriparian. Outside CFPO Recovery Area and PPC range. The NE portion is bisected by a tributary of Brawley Wash and is considered "Class II Wildlife Habitat". NW portion is heavily influenced by an existing wash system. Draft: Sonoran Desert Conservation Plan indicates the xeroriparian portions as "Important Riparian Areas", and the upland portions are included in the "Multiple Use or Recovery Management Areas".	Open Space River: 154.10 Sonoran Desertscrub Xeroriparian, Mesquite 115A 33%. Open Space Undisturbed: 154.11Sonoran Desertscrub, Creosote bush 234A 67%.	May provide mitigation potential as travel corridor for CFPO, particularly if the linkages to the north and south are enhanced and/or maintained.
G4	Wallis Farm	GROUPED WITH CLEARWATER PROJECT FARMS. SEE DAVISON FARM.			SOME
G5	Double Z. S. Farm	GROUPED WITH MORSE FARM AND DOUBLE Z.S. FARM. SEE GROWERS FINANCE FARM.			No mitigation value
G5	Growers Finance Farm	GROUPED WITH MORSE FARM AND DOUBLE Z.S. FARM. Minimal quality Mesquite along artificial or interrupted drainage ways and in old fields. Mesquite dominated vegetation quite well developed over most of the parcel most likely a result of its location in the Black Wash floodplain. Black Wash has been channelized on the eastern portion of the parcel, though it may still contribute sheetflow to portions of the parcel that are not channelized. The channel banks are lined with dense mesquite, many of which are greater than 6" in diameter at 4.5' above ground level. Most of the parcel has variable densities of shrubby mesquite. Two short rows of eucalyptus trees on the northern portion exist east of Sandario Rd. Abandoned concrete lined irrigation ditches are present throughout the parcel.	Harris Riparian Vegetation Map Classification: as including 224.52. Mesquite in Sec. 22, 24, 27, 34. However, the actual condition of vegetation on the parcel does not support the designation 224.52 in comparison to other sites that have that designation, except along the artificial wash channels. Bells vireos were observed along the channelized wash. No other special-interest species were observed. Has potential mitigation value as a travel corridor for CFPO and as a segment of the Brawley/Black Wash system and linkage to Class I and Class II habitat to the north and south.	Agricultural Land Out of Production: Sonoran fallow or vacant land, Mesquite-disclimaz, Mesquite, scattered cacti (cholla, prickly pear, barrel), weedy grasses and forbs. 2349A 100%	Yes

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Group	Farm	General Condition/ Vegetation	Condition/Location of Riparian Areas	Current Vegetation-General/ Association/ Dominant Species/ Acres/ % of Parcel	Mitigation Value
G5	Hill Farm	GROUPED WITH RYAN FIELD. SW & E ends undisturbed land bisected by minor washes that are channelized under Hwy 86 and flow N toward Black Wash with interruptions and diversions. Mesquite occur medium to high densities along Black Wash & minor washes. Small mesquites occur in uplands in low to medium densities where they are associated with cholla and burroweed. April 19/ 2002 visit SWCA scientist observed most of the land has been disturbed by various human activities. No saguaros and few mesquites greater than 6" in diameter at 4.5' above ground level.	Harris Riparian Vegetation Map Classification: 224.52 Mesquite. NW corner designated as Multiple Use or Recovery management Area. Eastern portion: Mesquite lined wash designated Important Riparian Area.	Open Space Undisturbed: 224.52 Sonoran Riparian Forest and Woodland, Mesquite (as tree) 112A, 7%. Open Space Undisturbed: 154.11 Sonoran Desertscrub, Mesquite and creosote bush, 432A 29%. Agricultural Land Out of Production: 364.1Sonoran Vacant or Fallow Land, Mesquite as shrub), burroweed, and grasses, 314A 21%. Institutional 6456A 43%	No mitigation value
G5	Morse Farm	GROUPED WITH MORSE FARM AND DOUBLE Z.S. FARM. SEE GROWERS FINANCE FARM.			No mitigation value
G6	Buckelew Farm	Brawley Wash crosses the property south to north and bisects the property into two portions. Portions of Brawley Wash are deeply eroded and form steep banks more than 10 ft. high, other portions are less eroded. Earth moving was done in some places along the wash to encourage water spreading and prevent erosion and flooding. A network of dirt roads crosses the retired agricultural land. A dirt road crosses the N portion of Sec. 21 and 22 running east-west. Much of the north half of this parcel is relatively undisturbed and appears to be valuable wildlife habitat. Most of the south half of this parcel is retired agricultural land with little vegetation.	Harris Riparian Vegetation Map Classification: Majority of riparian vegetation on this site is classified as 154.1000 Sonoran Desertscrub Xeroriarian, and a very small area in the NE corner of Sec. 22 as 224.5200 as Mesquite. The xeroriparian vegetation appears to be in good condition. Entirely in CFPO Recovery Area 1. The E 1/2 of Sec. 22 is within the Altar Valley Management Area. Within proposed Critical Habitat for the CFPO. Outside PPC range. Parcel is bisected by Brawley Wash which in this reach is considered "Class II Wildlife Habitat". Upland portions of the parcel are indicated as Biological Core or Recovery Management Areas (SDCP).	Open Space Undisturbed: 143.15 Scrub Grassland, Mixed grasses and shrubs 347A 23%; Open Space River and Undisturbed: 154.10 Sonoran Desertscrub Xeroriparian, Mesquite 40A 3%; Open Space Undisturbed: 154.11 Sonoran Desertscrub, Mesquite and creosote bush 445A 29%; Open Space River, 224.52 Sonoran Riparian Deciduous Forest and Woodland, Mesquite 5A 3%; Agricultural Land Out of Production: 364.1 Sonoran Vacant or Fallow Land, Mesquite (as shrub), burroweed and grasses 689A 45%	Yes. Priority Conservation Area

Condition of Habitat, Vegetation, and Riparian Areas (APP A)

Group	Farm	General Condition/ Vegetation	Condition/Location of Riparian Areas	Current Vegetation-General/ Association/ Dominant Species/ Acres/ % of Parcel	Mitigation Value
G6	Duval/ Penzoil Farm	Brawley Wash crosses the property S to N and bisects the property into two portions. Portions of Brawley Wash are deeply eroded, and form steep banks more than 10 ft. high, other portions are less eroded. Earth moving was done in some places along the wash to encourage water spreading and prevent erosion and flooding. The E 1/2 of the property includes primarily agricultural fields and earthwork (a levee and pit). The W 1/2 of the property is primarily undisturbed land, creosote-mixed scrub association. The area is very heavily grazed by cattle and does not support much forb or grass vegetation, although scattered perennial grasses including alkali sacaton are present. The parcel is crossed by a major immigrant trail and is littered with debris f from immigrants. The original vegetation of the land appears to have been creosote-mixed scrub association, saltbush association, and mixed grass-scrub series, mixed grass-mixed scrub association.	Harris Riparian Vegetation Map Classification: Majority of riparian vegetation is classified as 154.1000 Sonoran Desertscrub Xeroriparian. The xeroriparian vegetation is generally sparse and is not a well developed continuous corridor. Entirely in CFPO Recovery Area 1. Outside the Altar Valley Management Area. Within proposed Critical Habitat for the CFPO. W*ithin* PPC range. Brawley Wash area considered "Class II Wildlife Habitat". Upland portions of the parcel are indicated as "Multiple Use" or "Recovery Management areas. The xeroriparian areas are indicated as "Important Riparian Areas" (SDCP).	Open Space Undisturbed: 143.152 Scrub Grassland, Mixed grasses and shrubs with mesquite abundant 174A 11%; Open Space River and Undisturbed: 154.10 Sonoran Desertscrub Xeroriparian, Mesquite 250A 16%; Open Space Undisturbed: 154.11 Sonoran Desertscrub, Mesquite and creosote bush 487A 32%; Agricultural Land Out of Production: 364.1 Sonoran Vacant or Fallow Land, Mesquite (as shrub), burroweed and grasses 621A 41%	Yes. Priority Conservation Area

Adjacent Lands

Group	Farm	Adjacent Lands/APP A	Encroachment Issues/Adjacent lands/TAS Field Observations
G1	Hurst Farm	North: Private agricultural land. South, East & West: Private lands with low density residential development. Northwest corner: Undeveloped COT Simpson Farm South.	Neighbors have belongings on West COT property.
G1	Martin Farm	North: Active agricultural land. East: Active agricultural and low density residential land. South: Undeveloped river flood plain owned by Pima County. West: Mostly undeveloped river floodplain. Southwest corner: Active agriculture at the	
G1	Santa Cruz Farm	North: Private farmed land west half of parcel). East: COT Simpson Farm North, retired farmland. South: COT SIMPSON Farm South, retired farmland. Private, low density residential development, mostly mobile homes. West: Private, low density residential development and active agricultural State land.	Neighboring farm, Gary Dean, borders West property line.
G1	Simpson Farm North	North: Farmed Land East: Active agricultural & retired agricultural land. South & West: COT Santa Cruz Farm (retired farmland).	
G1	Simpson Farm South	North: COT Santa Cruz Farm (retired farmland), low-density residential developed private owned land; East: Active agricultural land. South: Undeveloped Sonoran Desertscrub, which is part of the COT Hurst farm. West: Low density residential development.	Problems with neighbors access to the SW. Need access gates to get to main road.
G2	Chu Farm	North, South, & West: Private owned agricultural and low density residential lands. East: Undisturbed State land with Sonoran Desertscrub vegetation.	Rick Westfal fence is located on COT property. There have been complaints from the neighbors regarding Tumbleweed encroachment.
G2	Comiskey Farm	North & South: private owned land. East: Private, agricultural, low density land adjacent to the north half of the parcel and State land (undisturbed open with Sonoran Desertscrub vegetation) adjacent to the south half. COT Levkowitz Farm boundaries the NE corner. West: Mostly private, undisturbed open land and COT Reeves Farm North.	This farm is fenced on the East property line along Avra Road only. There is evidence of ATV trespassing and neighboring fence line encroachment. There will be an easement dispute when gate and fencing are installed.
G2	Gin Farm	North: Active agricultural land privately owned. State land (undisturbed Sonoran Desertscrub). East: Active agricultural land. South: Private undisturbed Sonoran Desertscrub. Very low density residential land. West: Brawley Wash, several undeveloped private parcels and agricultural land.	Northwest area: Neighbors' fence (to the West) encroaches on COT property. Neighbors access their properties on COT road.
G2	James Glover Farm	North: Active agricultural land, privately owned. East: generally disturbed land with native Sonoran Desertscrub vegetation. Several bladed roads and other cleared areas. South: Private land with agricultural buildings, fields, and undisturbed Sonoran Desertscrub.	Glovers (neighboring property) have equipment on COT property. There is no established easement for the Glovers. Currently there is no fence or gate. There have been complaints from neighbors regarding noxious weeds. Pigweed present. Frequent trespassing.
G2	Levkowitz Farm	North & South: private owned land. East: Private, agricultural, low density land adjacent to the north half of the parcel and State land (undisturbed open with Sonoran Desertscrub vegetation) adjacent to the south half. COT Levkowitz Farm boundaries the NE corner. West: Mostly private, undisturbed open land. North & East: corner touches COT Chu Farm.	
G2	Lupori Farm	Northeast corner: COT Weinstein Farm, retired farm land. South: COT Reeves Farm North, East: Private owned lands. West: Active agricultural land.	

App A data © Draft: Biological Resources and Mitigation Opportunities and Constraints for City of Tucson Properties in the Avra Valley, Appendix A, September 2003
TucsonAudubon Society (TAS) Field Observations conducted August, 2006

Adjacent Lands

Group	Farm	Adjacent Lands/APP A	Encroachment Issues/Adjacent lands/TAS Field Observations
G2	Reeves Farm North	North: COT Lupori Farm, retired farmland, Private owned land. South: Private owned, undisturbed open space. East: COT Comisky Farm, retired farmland. West: Active agricultural land.	
G2	Reeves Farm South	Land surrounding this parcel is undisturbed or very low-density residential land that is privately owned and has Sonoran Desertscrub vegetation.	
G2	Weinstein Farm	All land adjacent to this parcel is privately owned with the exception of COT Lupori Farm touching the SE corner. North & East: Undisturbed land with Sonoran Desertscrub vegetation separated from this parcel by dirt roads. South: Active agricultural land. West: Brawley Wash and undisturbed land.	SW area experiences cattle intrusion.
G3	Anway Farm	North: COT Edward Anway Farm, retired farmland. East: active farm land, low density residential land. South: Largely undeveloped land subdivided into 10 acre plots. West: Undeveloped private land with a small pond.	Repeated issues with neighbor Glen Jones. Growing alfalfa on COT property, lost his cattle due to cattle grazing on COT property. Jones also has a garbage pit on COT property. Access issues between COT property. West: Experiences intrusion and debris from illegal immigrants.
G3	Edward Anway Farm	North: Active farmland. East: COT Tucker Farm(fallow farmland). South: A section with the west half private undisturbed open land and the east COT Anway Farm. West: COT Flying Bar E Farm.	NW property corner: Cattle encroachment from Agua Blanca Ranch. Illegal immigrant crossing from Trust 205 Farm.
G3	Flying “E” Bar Farm	North & West: Private small parcels, mostly developed as low density residential and horse properties. East: A section of State land, with a narrow strip of undeveloped land immediately adjacent to COT Edward Anway farm, and the remainder of the section actively farmed. South: Undeveloped Federal land in Ironwood Forest National Monument.	Neighbor Jeff Lange's fence intrudes on a small portion South side of property. George Ortega's cattle intrude on 1/4 mile of arroyo.
G3	John Kai Farms (AKA Hughes-Kai Farm)	North & East: Private owned open space, undisturbed, with Sonoran Desertscrub vegetation. South: COT Tucker Farm. Southwest corner: COT Edward Anway Farm. West: State land actively farmed.	
G3	Tucker Farm	North : COT John Kai Farm, retired farmland. West: COT Edward Anway Farm, retired farmland. East: several private owned lots, some with mobile or permanent homes, others currently undeveloped. South: Active farmed agricultural land.	Avra Valley Fire Department is not fenced. Chief Barry Gerber. . SW corner: Encroachment issues with Glenn Jones (neighbor to the W) fence on COT property.
G4	98 Farm	North & East: Private land developed as low density residential area. State land including active agriculture and some undeveloped land. South: Private land, Tohono O'odham land, Ironwood Forest National Monument. West: COT Wallis Farm.	Expect encroachment issues when new fence is installed. There were past issues of cattle intrusion but not currently.
G4	Bowden Farm	North: COT owned, retired farmland Nichols Farm and North Jarvis Farm and undeveloped private land and low-density residential development.; East: Undeveloped private land and Brawley Wash; South: Manville Rd and COT owned Retired agricultural lands Cactus Co. Avra Farm, South Jarvis Farm and Davison Farm; West: Retired agricultural land Nichols Farm.	SE corner Tumbleweeds from COT property prone to blow onto neighboring properties. Buffel Grass is also an invasive species here. Spraying was to occur this fall but did not happen due to rains. There are frequent ATV intrusions along the East property boundary.

App A data © Draft: Biological Resources and Mitigation Opportunities and Constraints for City of Tucson Properties in the Avra Valley, Appendix A, September 2003
TucsonAudubon Society (TAS) Field Observations conducted August, 2006

Adjacent Lands

Group	Farm	Adjacent Lands/APP A	Encroachment Issues/Adjacent lands/TAS Field Observations
G4	Cactus Co-Avra Farm	North: COT Nichols Farm and Bowden Farm, retired farmland. East: COT Jarvis Farm and Davison Farm, retired farmland. South: Federal land, Ironwood Forest National Monument. West: Private land subdivided for low-density residential development. Only partially developed at this time.	Humane Borders water station. Debris from illegal immigrants. Cactus-Avra is another farm experiencing an exponential population of Buffel Grass. Important legal issue if it were to reseed itself on neighboring properties.
G4	Cactus Co-Milewide Farm	North: COT Davison Farm North, retired farmland. East: Private land developed as low density residential area. State land including active agriculture and some undeveloped land. COT Wallis Farm, retired farmland. South: Private land, Tohono O'odham land, Ironwood Forest National Monument. West: Ironwood Forest National Monument, undeveloped state land.	Encroachment issues with neighboring property to the West.
G4	Davison Farm	North: COT Jarvis Farm South, retired farmland. East: Private land developed as low density residential area. State land including active agriculture and some undeveloped land. COT Bowden Farm, retired farmland. South: COT Cactus Co. Milewide farm, retired farmland. West: Ironwood Forest National Monument, undeveloped State land.	Buffel Grass growth potentially encroaching neighboring properties. Hunters intrude.
G4	Jarvis Farm North	North: Low density residential and undeveloped land. A rough dirt road borders the north end of the parcel paralleling a utility line. East: Private undeveloped land. South: Private land with low density residential and undeveloped parcels. COT Bowden Farm, retired farm land. West: COT Nichols Farm, retired farm land.	
G4	Jarvis Farm South	North: COT Bowden Farm North, retired farmland. East: Private land developed as low density residential area. State land including active agriculture and some undeveloped land. COT Bowden Farm, retired farmland. South: COT Davison farm, retired farmland. West: COT Cactus Co. Avra Farm, retired farmland.	
G4	Nichols Farm	North: Dirt road and power line. North of the road is low density residential development. NW corner: Power substation. East: COT Jarvis Farm and Bowden Farm, retired farmland. West: Private owned agricultural land and low density residential development.	Trico substation located West of NW corner.
G4	Trust No. 205	North, South & West: Bordered by Ironwood Forest National Monument. NE corner: Bordered by privately owned land with low density residential development. East: Undeveloped private land.	Cattle intrusion. Cattle walk right through Environmental fencing. There will be intrusion/encroachment issues when new fence is installed.
G4	Wallis Farm	North & East: Private land developed as low density residential area. State land including active agriculture and some undeveloped land. South: Private land, Tohono O'odham land, Ironwood Forest National Monument. East: COT 98 Farm, retired farmland. West: Ironwood Forest National Monument, undeveloped state land.	NE property line: encroachment disputes regarding fence line/property lines. West half of property: Hunters trespass due to large population of birds.
G5	Double Z. S. Farm	North: Private undeveloped land and Tohono O'odham land actively farmed. East: Private, State and Pima Co. Flood Control District land, all undeveloped or developed at very low density. South: Private land with multiple lots for low density development. West: Private land with multiple lots for low density development and undeveloped Pascua Yaqui land.	

App A data © Draft: Biological Resources and Mitigation Opportunities and Constraints for City of Tucson Properties in the Avra Valley, Appendix A, September 2003
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Adjacent Lands

Group	Farm	Adjacent Lands/APP A	Encroachment Issues/Adjacent lands/TAS Field Observations
G5	Growers Finance Farm	North: Private undeveloped land and Tohono O'odham land actively farmed. East: Private, State and Pima Co. Flood Control District land, all undeveloped or developed at very low density. South: Private land with multiple lots for low density development. West: Private land with multiple lots for low density development and undeveloped Pascua Yaqui land.	SE portion recurrent ATV intrusion. Pipeline easement to reservation.
G5	Hill Farm	North: Undeveloped private land, with several parcels of various sizes. East: Undeveloped State and private land. South: Undeveloped State and Federal land. West: Undeveloped State and subdivided private land with low-density residential development.	Ryan Airfield controls the gate on the E property line.
G5	Morse Farm	North: Private undeveloped land and Tohono O'odham land actively farmed. East: Private, State and Pima Co. Flood Control District land, all undeveloped or developed at very low density. South: Private land with multiple lots for low density development. West: Private land with multiple lots for low density development and undeveloped Pascua Yaqui land.	
G6	Buckelew Farm	North: Undeveloped State land. Northeast: Undeveloped State land. South: Active agricultural land. West: Low density, private owned, residential development, undeveloped small parcels, undeveloped State land.	Quad tracks evidence of intrusions due to lack of fencing.
G6	Duval/ Penzoil Farm	Bordered on all sides by private, County, State and Federal lands generally undisturbed grazing land with several stock ponds, fences and dirt roads. North: Ajo Hwy, across which is active private farm land. West: Pima County conservation land.	ADOT erosion issues. State agricultural people leased land on E property line. Need gates to allow crossing to leased property. Cattle still grazing due to lack f fencing.

Tucson Audubon Field Observations

Group	Farm	Field Observation	General Farm Condition	Vegetation	Location of Riparian Areas	Wildlife	Restoration Potential	Washes
G1	Hurst Farm	8/31/2006	SE area: exhibits substantial erosion. Very sandy soils with sparse native vegetation. Difficult to navigate this area it was so over grown with weeds. NE area: Restoration potential. Receives floodwaters. NW area: Vegetation restoration potential if well is reactivated.	SE area: Mesquite (bush), White Thorn Acacia and weedy areas (pigweed). NE area: Barrel Cactus, Saguaros and debris noted. Creosote, dense Mesquite in ditch to the East. Hedgehog Cactus. NW area: Sandy soils observed. No under story. Creosote, Mesquite, pigweed	Designated Important Riparian Area along the Brawley Wash corridor.	Swainsons Hawk. Abundant Lizard population noted in the SE area.	Potential	Brawley Wash corridor
G1	Martin Farm	8/29/2006	A berm bisects the central area of the Martin Farm East to West. Water overflowing from the Santa Cruz River during the 7/2006 flood was up to the berm. North area: Very weedy. SE area: Low profile growth area due to flood waters from the Santa Cruz River. Erosion from July , 2006 floods. West: Fence washed out from flood.	North area: Open area, no trees, and seasonal grasses only. Tall Weeds. SW area: Some Cholla, dense Creosote, This is a low profile growth area due to flood waters from the Santa Cruz River overflowing. West area: Sparse vegetation. Mesquite (bush) dominant. Potential restoration SE area: Tamarisk, Mesquite, ground cover and grasses.	Along the Santa Cruz River area.	Coyote	Potential	Santa Cruz River

Tucson Audubon Field Observations

Group	Farm	Field Observation	General Farm Condition	Vegetation	Location of Riparian Areas	Wildlife	Restoration Potential	Washes
G1	Santa Cruz Farm	8/31/2006	"The City of Tucson is applying to FEMA for funding to repair damaged fences and flood control dikes at Simpson Farm. Damage was done by flooding at the end of July 2006. The perimeter fence around the site is damaged in three places where flood waters came through, on the east, west, and north sides of the site (see attached map). Flood control dikes were breached by flooding in two areas. One area is south of the Santa Cruz River and immediately west of Trico Road (breaches 1-4 on the map). The other area is a series of breaches in the dike running immediately along the left bank of the river farther northwest (labeled A-I on the map)." Kendall Kroesen	Thriving vegetation, Cottonwood/Willow, Mesquite, Palo Verde along the Santa Cruz River Corridor. Tail water from the neighbor to the E runs W parallel along Hardin Rd (North property line) attributing to denser vegetation. Wild Sunflowers and Tobacco Plant, large Creosote and Mexican Elderberry.	Designated Important Riparian Area along the Santa Cruz River and to the SW corner of the property.	Red tail Hawk	Potential	Santa Cruz River, Brawley Wash
G1	Simpson Farm North	8/30/2006 (PQ) 2/21/2002 (KK) 10/2/2002 (KK)	NW area: Water from farm to the east flows parallel to the road here. Santa Cruz River Restoration area: See Simpson Habitat Restoration Summary. See Santa Cruz Farm for Fema information.	NW area: Tamarisk, Palo Verde, grasses, Cottonwood, Mesquite, Pigweed, Mexican Elderberry. North: Tobacco Plant, Tamarisk, Grasses, and some Mesquite along roadside. Santa Cruz River Restoration area: A robust cottonwood/willow gallery forest has developed with substantial increases in tree height and density.	Most of the Simpson Farm North is Designated Important Riparian Area.	Swainson's Hawk, Yellow-billed cuckoo, Spotted Ground Squirrel	Tucson Audubon Society Restoration Project began in 2002. Right of Entry agreement extends through the year 2100	Santa Cruz River, a water feed from the neighboring farm to the East runs along the North property line

Tucson Audubon Field Observations

Group	Farm	Field Observation	General Farm Condition	Vegetation	Location of Riparian Areas	Wildlife	Restoration Potential	Washes
G1	Simpson Farm South	8/31/2006	SE area: Sparse vegetation. South Central: Creosote, grasses. Large Creosote along fence. Several open areas with no vegetation. West area: Indian artifacts have been found in this area. Archaeological surveys conducted 1/18/2001, 2/10/2001, 5/12/05.	NW area: Few Mesquite. Creosote dominant and Grasses. SE area: Few Mesquites (bush), grasses South central area: Large Creosote and grasses along fence.	A expanse of Designated Important Riparian Area bisects the farm SE to NW. A small portion of the SW corner influenced by its proximity to the Brawley Wash is Designated Important Riparian Area.			A small portion of the SW corner influenced by its proximity to the Brawley Wash to the West
G2	Chu Farm	8/23/2006	This farm stands alone. It is surrounded by community and no other COT property. Mowing has been the tactic used to prevent Tumbleweed growth. SE corner: Westfall's fence encroaches on COT property. The NE property area primarily dense weeds.	SE corner: Mostly grasses and weeds. Midway N property line: Grasses, weeds, Mesquite. SW property corner: Sparse vegetation, Mesquite (bush).	None			
G2	Comiskey Farm	8/23/2006	This farm is only fenced on the East property line along Avra Road. There is evidence of ATV trespassing and neighboring fence line encroachment. North 1/2 and E section of farm: East Branch of the Brawley Wash runs from mid South property line North. Northwest corner: Pond holding water at this time.	E property line: An arroyo parallels the E property line, supporting a diversity of vegetation: Sagebush, Saltbush, 1 Saguaro was observed. SE section of the parcel: Sparse vegetation. Wide open areas with little or no vegetation, few Mesquites (bush). Northwest corner: Dominant Mesquite vegetation perimeters the pond.	North and West areas and along East Branch of the Brawley Wash.	Quail, a variety of small birds.	Potential, although, appears to be regenerating well on its own.	East Branch of the Brawley Wash, Unknown wash West side of parcel, a pond exists in the NW property corner

Tucson Audubon Field Observations

Group	Farm	Field Observation	General Farm Condition	Vegetation	Location of Riparian Areas	Wildlife	Restoration Potential	Washes
G2	Gin Farm	8/29/2006	NW area: During rains, water flows East to West toward Brawley Wash which cuts through the far NW corner. An adobe block company used to lease here. They dug a large basin to use the clay for adobe. It may be possible to utilize the basin for harvesting rainwater.	South mid property line: Few Mesquites with dense grass and weeds due to rainfall. Central area: Paloverdes, few Mesquite, grasses NW area: Sparse vegetation. NE property corner: Some Paloverdes and Mesquite, seasonal grasses and weeds. North central Barrel Cactus, Creosote, Russian Thistle, Cholla, weeds. SW property corner: Observed Pear cactus and Cow's Tongue Cactus, may have been planted.	Far NW property area extends Southward and also parallels the South property line of the NW area into the central portion of the property. There exists another expanse of riparian area paralleling the SE property line to the South.		Potential	Brawley Wash West property line
G2	James Glover Farm	8/25/2006	Weeds dominate most of the farm. Farm has received mowing several times for weed prevention. West property line exists on W side of arroyo although COT fence exists on the E side of the arroyo. This farm is in extreme need of restoration, but no water source available.	NW property corner: Dense weeds with some bare areas. Restoration recommended for weed prevention. There have been complaints from neighbors regarding noxious weeds. Pigweed present. Water present in ditch most of year. SW corner: Sparse vegetation. NE pr	Southwest corner influenced by its proximity to Brawley Wash to the West.	Red tail Hawk	Possibly planting trees along the ditch on the N property line would prevent Tumbleweed invasion.	Southwest corner influenced by its proximity to Brawley Wash parallels the West property line.
G2	Levkowitz Farm	8/23/2006	SW area: Wide open areas with no vegetation. SE area: Open areas with no vegetation.	SW area: Little to no vegetation. North: Desert Broom, Mesquite. Hedgehog Cactus. SE area: Open areas with no vegetation. No under story. Small Mesquites.	Northwest and West areas influenced by the East Branch of the Brawley Wash existing further West.	Jack Rabbits		Northwest and West areas influenced by the East Branch of the Brawley Wash existing further West.
G2	Lupori Farm	8/29/2006	East: An irrigation ditch parallels the E property line. Lower 1/2 of the E property receives more moisture providing for denser vegetation. An old irrigation ditch parallels the south property line. Land appears to be recovering. SW area: Ditch that is still holding water after rain 6-7 days earlier.	Lower 1/2 of the E: Dense Mesquite (bush), Sagebrush, Saltbush. White Thorn Acacia. SW area: Dense Mesquite in ditch. North: Few Mesquite (bush), grasses, some Desert Broom.	None located on Lupori Farm. Although there is Riparian area located to the East of the property panning a South to North direction.	Observed 2 Great Horned Owls, Doves, Vultures and Rabbit.		

Tucson Audubon Field Observations

Group	Farm	Field Observation	General Farm Condition	Vegetation	Location of Riparian Areas	Wildlife	Restoration Potential	Washes
G2	Reeves Farm North	8/23/2006	The West Branch of the Brawley Wash runs through the West portion of the property. Flow from pond located on NW corner of Comisky occurs across Reeves North SE to NW. SW corner: Road issue/fenced in from actual property corner so neighbors are able to get through.	NE corner: Small Mesquites. SW corner and NW corner: Mesquite, White Thorn Acacia. SW corner: Appears to be recovering well. Previously mowed regularly. Mesquites are dominant with little other vegetation. Inner SE corner: Potential for introducing more diverse species.	West Branch of the Brawley Wash corridor and the East portion of the property.	Peregrine Falcon, Coyote, 3 Great Horned Owls.	SE corner: Potential for introducing more diverse vegetation. Receives water from Comisky Farm pond to the East.	West Branch of the Brawley Wash West side of property
G2	Reeves Farm South	8/25/2006	Appears water remains on surface for a period of days after rainfall. Rain occurred last two days previous to the field visit and water was still standing in many areas. Appeared to be a high clay soil content. This parcel was originally ranched, not farmed.	Inner NE corner: Cholla, Mesquite (bush), Barrel Cactus. NW property corner at pond: Dense vegetation: 2 Saguaros, White Thorn Acacia, grasses, Saltbush. NW corner: Mesquite, Saltbush. SW corner: Large areas of sparse vegetation. SE corner: Sparse vegetation.	The Designated Important Riparian area bisects the center of the farm in a N to S direction, with very small riparian areas occurring in the far SW corner and the far NE corner.	Ground Squirrel, on-eared owl, Swainson's Hawk, Cottontail Rabbit	Potential due to rate of standing water.	A sub stream of the West Branch of the Brawley wash bisects South Reeves South to North
G2	Weinstein Farm	8/29/2006	The entire perimeter is old fence and is scheduled for new. Water runs from E to W across Weinstein Farm. SW area experiences cattle intrusion.	SE property corner: Small Mesquite, grasses, some Desert Broom along E Roadside. SW area: Less vegetation. Creosote, Whitethorn Acacia, Mesquite, Sagebrush. North central property: Few Mesquite trees with grasses due to rains. Some Cholla, Barrel Cactus and grasses.	Riparian area fans throughout the N and central area of the property.	Red Tail Hawk	Potential for restoration if well is reactivated.	

Tucson Audubon Field Observations

Group	Farm	Field Observation	General Farm Condition	Vegetation	Location of Riparian Areas	Wildlife	Restoration Potential	Washes
G3	Anway Farm	8/21/2006	Central E corner: Receives tail waters from neighboring farm to the E. NW property line along W fence line. Approx. ½ mile from NW property corner an overflow pipe from pond is directed toward a ditch and the next pond to the West. West side of parcel, upper 1/3 portion: Two ponds holding water. NE corner: Tail water pond and ditch with no water.	SE corner: Paloverdes, Large Mesquite, some pigweed. Under story sparse. Central E corner: Dense vegetation. NW corner: Mesquites and grasses occur around the ponds. Viewing SW of the NW corner: The vegetation is more sparse with little under story.	A small portion of the SE property area.	Black-tailed Jack Rabbit. SE corner: The pond here appears to be a haven for bird. Roadrunner,	West side of parcel: Ponds holds water year round providing the potential to increase plant species diversity and to enhance wildlife habitat.	A pond exists in the SE property corner which holds water most of the year. Two other ponds exist in the Northern property area
G3	Edward Anway Farm	8/21/2006	NW property corner: Cattle Encroachment from Agua Blanca Ranch. Irrigation ditch parallels bermed arroyo. Illegal immigrants cross here from Trust 205 Farm. Blanco Wash bisects the West side of the farm S to N.	NW property corner at arroyo: Vegetation seems to be recovering well on its own. Dense vegetation including White Thorn Acacia, Creosote & Mesquite along arroyo all the way to Flying "E" Bar Farm. East property line: Dense vegetation. Water level was high washing across Aguirre Rd.	SW area along Blanco Wash.	SE property area revealed Bobcat prints.	Little potential	Blanco Wash
G3	Flying “E” Bar Farm	8/21/2006	West Property line: Property line is beyond fence in wash. COT land encroachment. Neighbors have fence on COT property. George Ortega's cattle encroachment occurs along the E property line. Foot prints (Human and Horse) were observed inferring intrusion. SW corner: An abandoned landing strip.	SE property corner: Creosote. West Property line: Dense vegetation continues through to S of parcel. Mesquite (bush), grasses. North property line: E receives water from Arroyo to the N and E. Sparse vegetation. Few Mesquites (bush). North: Dense Acacia.	None		Possible potential along the South property line where the arroyo collects water during rainfall.	The West Branch of the Brawley Wash although not located on Flying " E" Bar parallels the property to the East
G3	John Kai Farms (AKA Hughes-Kai Farm)	8/21/2006	Vegetation uniform throughout parcel. No available water. Sparse vegetation.	SW corner: Sparse vegetation. Few Mesquites bush), grasses. 1 Barrel cactus. No available water. NW and NE corner has similar vegetation. East property line: Eucalyptus trees along fence line.	None	Swainson’s Hawk		

Tucson Audubon Field Observations

Group	Farm	Field Observation	General Farm Condition	Vegetation	Location of Riparian Areas	Wildlife	Restoration Potential	Washes
G3	Tucker Farm	8/21/2006	Tucker Farm is the last farm that COT bought in Avra Valley. SE corner: The Avra Valley Fire Department is housed here. Water travels NW sheeting in low spots only. SW corner: Encroachment issues with Glenn Jones (neighbor to the W) fence on COT property.	SE corner: Receives sheet rain only. Sparse vegetation. SW corner: Grasses, few trees.	None			
G4	98 Farm	8/21/2006	98 Farm is located just E of Wallis Farm which is part of CAVSARP. The Black Wash bisects the SE property corner from SE to NW. Along the Black Wash, West central section of the parcel: Receives flood waters causing erosion cutting through the landscape.	N 1/3 W side of parcel: Vegetation sparse. Few Mesquite. Little other vegetation. Along Black Wash, West central section of parcel: Flood waters may provide potential for restoration. Black Wash. SW section of parcel: Directly along the wash exists some vegetation.	Along Black Wash, and a small area which parallels the N property line.	Swainson's Hawk, Red Tail Hawk, Mojave Rattlesnake	Black Wash provides potential water source for restoration.	Black Wash
G4	Bowden Farm	8/18/06	The Bowden Farm has experience an exponential population of Buffel Grass. The Baseline Photo Points were set 6/30/2006. Tumbleweed is also an invasive species here. Along the West Branch Brawley Wash in the far furthest E and N corner the berm is blown out.	SE area: Abundant Creosote, Tumbleweeds, grasses present. With the rains this season, grass cover dominates inhibiting growth of tumbleweed that once dominated this area. Mesquite (bush), Desert Broom present. Dense vegetation, low sage like plants. NE corner: Vegetation much the same as the SE corner.	Along West Branch of the Brawley Wash.	Lizards (unidentified) . Observed deer droppings.	Potential, due to flood waters from the West Branch of the Brawley Wash to the E and 2 ponds on the W side of the farm. Restoration may prevent invasive species.	The West Branch of the Brawley Wash Two ponds exist along the West/North property area
G4	Cactus Co-Avra Farm	8/16/06	N Trico Rd bisects the West side of the farm. Several Ditches grid the property. Mid W inner property corner: Observed evidence of illegal migration. East: Arroyo runs the length of the property line's corner: Humane Borders water station.	Uniform vegetation throughout the parcel with the exception of Eucalyptus trees in the Mid West inner property corner. Cholla, Creosote, White Thorn Acacia, grasses	Bordering the South property line.	Dove, Red Tail hawk		

Tucson Audubon Field Observations

Group	Farm	Field Observation	General Farm Condition	Vegetation	Location of Riparian Areas	Wildlife	Restoration Potential	Washes
G4	Cactus Co Milewide Farm	8/14/2006	A recharge basin is located the center of the farm. The Cocoaque Ranch is located to the South boundary. A sub stream of the Brawley Wash parallels the West boundary and the Black Wash to the South 1/2 of the East property line. Wallis Farm shares the East boundary and Davison Farm the North boundary. A plateau created with earth from the CAP exists in the NW corner. South property line is in the wash to the South of the fence. The Ironwood Forest National Forest borders the South property line.	South: Sparse grasses, Cholla, Creosote, Small Mesquite. Denser vegetation on either side of berm. Southwest area: Paloverdes, White Thorn Acacia, Large Mesquite, some Ironwood. NW corner: Little vegetation, few Mesquites and grasses.	None	Juvenile hawk		Brawley Wash parallels the West property line, and a sub stream of the Black Wash parallels the South 1/2 of the East property line. A recharge basin is located central property area
G4	Davison Farm	8/14/2006	Cactus Co. Milewide shares Davison's Southwest boundary. The West side of the farm is bisected N to S by N Reservation Rd and Luckett Rd. A pond exists in the Northeast area. TIMPA controls/leases a portion of the East side of the farm. East of Luckett Rd along the North property line: Training site for graders.	Central fence line along Luckett Rd: White Thorn Acacia along wash. North central: Plateau created from earth from CAP supports diverse vegetation. Saltbush and Mesquite were planted here. West: 90% Buffel Grass. East of Luckett Rd along the North property line: May be potential for restoration. East fanning to South exists areas of vegetation where water accumulates. NE corner: Large Mesquite, Desert Broom, grasses. There also exists a large open area between two berms with sparse vegetation, small Mesquite. West: Along the wash, Pygmy Owls live in the berm. The wash supports Whitethorn Acacia, Paloverdes, Desert broom.	Northeast corner and a small portion North of the Northeast boundary.	West: Along the wash, Pygmy Owls live in the berm.		West Branch of the Brawley Wash, Tail water pond in the NE property area

Tucson Audubon Field Observations

Group	Farm	Field Observation	General Farm Condition	Vegetation	Location of Riparian Areas	Wildlife	Restoration Potential	Washes
G4	Jarvis Farm North	8/18/2006	The West side of the farm is bisected by Nelson Quihuis Rd. A sub stream of the Brawley Wash cuts through the NW corner of the farm. The West Branch of the Brawley Wash runs through the NE corner of the farm. Erosion occurs through the East 1/2 of the farm. Bowden Farm shares the South boundary and Jarvis Farm the North boundary. SW area: Erosion with pathways of sheetflow from SE to NW.	SW area: Potential for restoration with sheetflow in this area. Overall Sparse vegetation.	NW property area and the Eastern portion of the farm.		Some	West Branch of the Brawley Wash
G4	Jarvis Farm South	8/16/2006	A berm parallels the West boundary providing habitat for Burrowing Owls. There also exists a berm in the SE corner.	South: Buffel Grass, Creosote, Whitethorn Acacia, Small Mesquite. SE and NW areas: Tall Pigweed. West: Grasses, Wild Prosso Millet .	A small portion of the far NE corner.	Burrowing Owls		The Brawley Wash influences the SE corner of the property
G4	Nichols Farm	8/18/2006	A sub stream of the West Branch of the Brawley Wash touches the NE corner. An access road runs along the lower East boundary, through the center of the farm then along the West boundary to a Trico station in the NW corner. North: Ditch and flood plain. Bowden farm shares the Southeast boundary.	North: Sparse vegetation. NW corner: Small Mesquite, Pigweed, weedy, grasses. NE corner: The ditch supports slightly denser vegetation. SW corner: Few Mesquites, some Cholla.	Parallels the East boundary.	Rattlesnake bees		A sub stream of the West Branch of the Brawley Wash influences the NE property corner
G4	Trust No. 205	8/16/2006	A tributary of the Blanco Wash fans throughout the farm in a general NW to SE direction. Cattle encroachment issues in the North. The Ironwood National Forest shares the NW boundaries. South: Arroyo filled with debris from Illegal immigrants crossing.	West: Creosote, Mesquite. North: Creosote. SW corner: Ironwood, vegetation so dense nearly impossible to navigate. NW corner: Creosote dominant, some Ironwood. NE corner: Dense weeds due to rains.	Primarily the NE area with some riparian areas extending central and south central. A portion of the NW area.		Yes	Sub streams of the Blanco Wash

Tucson Audubon Field Observations

Group	Farm	Field Observation	General Farm Condition	Vegetation	Location of Riparian Areas	Wildlife	Restoration Potential	Washes
G4	Wallis Farm	8/14/06	Several recharge basins span the property. The Black Wash cuts across the NE corner and the West Branch of the Brawley Wash parallels the West boundary. NW corner: Water sits here for some time after rains. Potential area to plant trees. NE corner has encroachment issues with neighbors fence on COT property. Trees were planted on and along the berms of the Recharge Basin. Due to lack of maintenance, few trees have survived. Central access road runs north to south along recharge basins. NE corner holds a considerable amount of rainwater. A pond exists in the Mid West property area. Archeological artifacts reported in the SW area.	West: Pond exhibits dense vegetation. Creosote, saltbush, Small Mesquite, 2-3 Saguaros. NE area: Dense Creosote. NE portion of Sec 8, East Central area of parcel: Creosote, Saltbush, Mesquite (bush), a few Saguaros.	Western portion and along Black Wash	Rich bird population, Mature Hawk with offspring at entrance. 4 White Egrets, several Blue Heron, many Dove present at Recharge Basins. Red Racer, Black Racer, several Vultures, Raccoon prints.	Yes. Potential to plant basins to prevent weeds. The NW area much water sits after rains.	West Branch of the Brawley Wash. The Black Wash.
G5	Double Z. S. Farm	8/9/2006	The Black Wash parallels the East boundary but does not appear to provide any water to the farm. Morse Farm and S Tara Rd share the West boundary. Growers Finance shares the North boundary. Sandario Rd bisects the center of the property North/South.	Vegetation overall sparse, some Mesquite and grasses with the exception of the North 1/4 of the West area the Mesquite is dense.	To the East of the farm along Black Wash and South of the SE corner			The Black Wash influences the Eastern property area

Tucson Audubon Field Observations

Group	Farm	Field Observation	General Farm Condition	Vegetation	Location of Riparian Areas	Wildlife	Restoration Potential	Washes
G5	Growers Finance Farm	8/9/2006	Shares the South boundary with Morse and Double Z.S. Farms. The Black Wash enters the farm at the far NW corner and then directs South through the East portion of the farm. A sub stream exists in the NW of the farm and parallels the far West boundary but does provide much overflow to the farm. Sandario Rd intersects the farm North/South. Two pond exist in the NW 1/5 of the farm. One is dry and one is holding water. U of A test area with Eucalyptus trees 1/2 the distance between East of Sandario Rd and the Black Wash.	North: Sparse vegetation, few Mesquite. Berm breached to the SW. Overall: Large open areas with sparse vegetation with the exceptions along the berms and the wet pond where denser vegetation exists, Mesquite dominant.	North area, South of the SE corner and NW of the NW area.		Some potential in the North along the Black wash	Black Wash
G5	Hill Farm	8/31/2006	Ryan Air Field Shares the East boundary. An arroyo exists to the West boundary with much erosion in this area. An are smaller arroyo exists on the East boundary. A power line parallels the East boundary and arroyo.	Vegetation dense along arroyos. Overall vegetation seems to be recovering well with diverse variety. Cholla, Barrel Cactus, Spoon Cactus, Creosote, small Mesquite, thick grasses.				Small washes have been cut across and redirected at several points on the parcel, an arroyo influences the West property area
G5	Morse Farm	8/9/2006	U of A test area with Eucalyptus trees in the NE area. Shares East boundary with Double Z.S. Farm and the North Boundary with Growers Finance Farm.	Vegetation overall sparse, Small Mesquite and grasses. Mesquite more prominent where the land receives sheet flow from the Black Wash.				The portion of the Black Wash that crosses the parcel has been channelized and is now a drainage ditch.

Tucson Audubon Field Observations

Group	Farm	Field Observation	General Farm Condition	Vegetation	Location of Riparian Areas	Wildlife	Restoration Potential	Washes
G6	Buckelew Farm	8/31/2006	The West Branch of the Brawley Wash cuts throughout eh NE corner then parallels the East boundary with sheet flow throughout the NW area. A pond is located West of the Wash in the central North area. North 1/4 of West boundary area: Large area of dark volcanic rock. Sheetflow is also evident originating from a sub stream to the East flowing westward onto the lower 1/2 of the farm. Pascua Yaqui land shares the North boundary. Debris present from illegal immigrants. Intrusion of ATV vehicles present on the Eastern boundary where no fence exists. Archeological remnants located in the North. The access road on the NE boundary is washed out. Sheetflow appears to cross the land in a NW direction. A berm on the lower West boundary is breached. The berm on the East boundary prevents flood waters from entering this area, but may be a potential area for restoration with earthworks.	SE area: Open areas, few Mesquites, grasses. Inner NE corner: Some Tumbleweed, Paloverdes, Small Mesquite, Creosote. North central, pond, West of Wash: Mesquite Dominant. NW area: Creosote dominant. North 1/4 of West boundary area: Ocotillo, Paloverdes (Mexican), young Saguaro, Barrel cactus and bushes see photo points).	Throughout most of the farm	Gila Monster Roadrunner Quail Jack Rabbit	The lower Eastern boundary presents potential with the sheetflow it receives.	West Branch of the Brawley Wash

Tucson Audubon Field Observations

Group	Farm	Field Observation	General Farm Condition	Vegetation	Location of Riparian Areas	Wildlife	Restoration Potential	Washes
G6	Duval/ Penzoil Farm	8/31/2006	The West Branch of the Brawley Wash bisects through the center of the property in a SW/NE direction. Sheetflow from the SE influences much of the East boundary. Ponds exist in the NE area and East central area. State Agricultural Land to the SW area of the West boundary, and State Leased Land is the East of the East central boundary. A recharge basin is located on the East side of the wash, West central Sec. 8. An abandoned landing strip located East of wash in South central Sec. 5. Ruins of cattle pens located in the NE area. Mid Sec.. 18: Military testing for surveillance aircraft. SE pond area: Area difficult to navigate with no established access roads. The West boundary was inaccessible due to flood caused erosion and no established access roads.	North area: Pigweed, Little Mesquite along irrigation ditch, Spoon Cactus, Whitethorn Acacia, Cholla. West of pond exhibits open areas with pigweed. Around pond lives Barrel Cactus, Mesquite, Mexican Paloverdes. Mid Sec. 8 along berm: parse, some Creosote, Mesquite. SE pond area: Mesquite and weeds. South: Cholla.	Most of the farm concentrated along Brawley Wash	Ravens Swainsons Hawk Flycatchers Roadrunner Sparrow Hawk Jack Rabbits Bald Eagle Red Tailed Hawk White Tailed Kite	Appears to be recovering well, however potential exists to harvest flood waters for restoration.	West Branch of the Brawley Wash, a pond in the NE property area

An Archaeological Survey of the Tucson Audubon Society's North Simpson Farm Agricultural Restoration Project, Pima County, Arizona

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Project Report No. 00-140
Desert Archaeology, Inc.
(DAI Project No. 00-119A)
3975 North Tucson Boulevard, Tucson, Arizona 85716 • 18 January 2001

REPORT ABSTRACT

DATE: 18 January 2001.

AGENCY: Tucson Audubon Society, Tucson, Arizona, U.S. Fish and Wildlife Service.

PROJECT TITLE: An Archaeological Survey of the Tucson Audubon Society's North Simpson Farm Agricultural Restoration Project, Pima County, Arizona.

PROJECT DESCRIPTION: An archaeological survey of the ground surface in advance of an agricultural restoration project southwest of the Santa Cruz River, located southwest of the corner of Trico and Hardin roads, west of Marana, Pima County, Arizona.

PERMIT NUMBERS: Arizona State Museum Permit 2000-3bl.

LOCATION:

> **COUNTY:** Pima.
>
> **DESCRIPTION:** The project area is located southwest of the corner of Trico and Hardin roads, west of Marana in the S¼ of the SE¼ of Section 15, Township 11 South, Range 10 East on USGS 7.5-minute topographic quadrangle map, West of Marana, Arizona [AZ AA:11(NE)].

NUMBER OF SURVEYED ACRES: 50 acres.

NUMBER OF SITES: 1

LIST OF REGISTER ELIGIBLE PROPERTIES: 1

LIST OF INELIGIBLE SITES: 0

COMMENTS: One site, AZ AA:11:133 (ASM), was located in the project area. Avoidance is recommended.

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AN ARCHAEOLOGICAL SURVEY OF THE TUCSON AUDUBON SOCIETY'S NORTH SIMPSON FARM AGRICULTURAL RESTORATION PROJECT, PIMA COUNTY, ARIZONA

An archaeological survey of the North Simpson Farm, west of Marana, Pima County, Arizona was requested by the Tucson Audubon Society to determine if significant cultural resources were located on the property. The North Simpson Farm consists of 400 acres of retired agricultural land currently owned by the City of Tucson. Funding for the restoration work comes from the U.S. Fish and Wildlife Service (USF&W), U.S. Army Corp of Engineers (COE), and Arizona Water Protection Fund (AWPF). USF&W-funded restoration work will occur within a 50-acre area in the southern portion of North Simpson Farm (Figure 1). The results of an archaeological survey of this 50-acre area are presented here.

In the remaining 350-acre area of the North Simpson Farm, 6 acres of COE and 20 acres of AWPF-funded riparian restoration work will occur. Since the entire North Simpson Farm project area may eventually be restored, the Tucson Audubon Society requested an archaeological survey and geoarchaeological assessment of the remaining 350 acres on the North Simpson Farm. The results of the archaeological survey and geoarchaeological assessment of that remaining 350-acre area of the North Simpson Farm are presented elsewhere (Stevens 2001). Future restoration work will occur in stages based on the results of the proposed riparian and agricultural restoration work described above. Specific work sites and associated fencing, rainwater harvesting, and planting locations in current and future restoration activities will be selected based on the results of the restoration site assessments and the archaeological surveys and geoarchaeological assessment reported here and elsewhere (Stevens 2001).

The principal investigator on the project was William H. Doelle of Desert Archaeology, Inc. The survey was conducted by Michelle Stevens and Andrew Dutt of Desert Archaeology, Inc., under the authority of the State of Arizona General Antiquities Permit 2000-3bl. The survey was undertaken on 24 November 2000. One archaeological site and one isolated occurrence were recorded. This report provides the project area location and description, historical and archaeological background of the project area, the results of the survey, and specific recommendations. All project records are curated at the Arizona State Museum (ASM).

PROJECT AREA LOCATION AND DESCRIPTION

The North Simpson Farm Agricultural Restoration Project is located at the southwest corner of Trico and Hardin roads, west of Marana in the S½ of the SE¼ of Section 15, Township 11 South, Range 10 East on USGS 7.5-minute topographic quadrangle map, West of Marana, Arizona [AZ AA:11(NE)] (Figure 1).

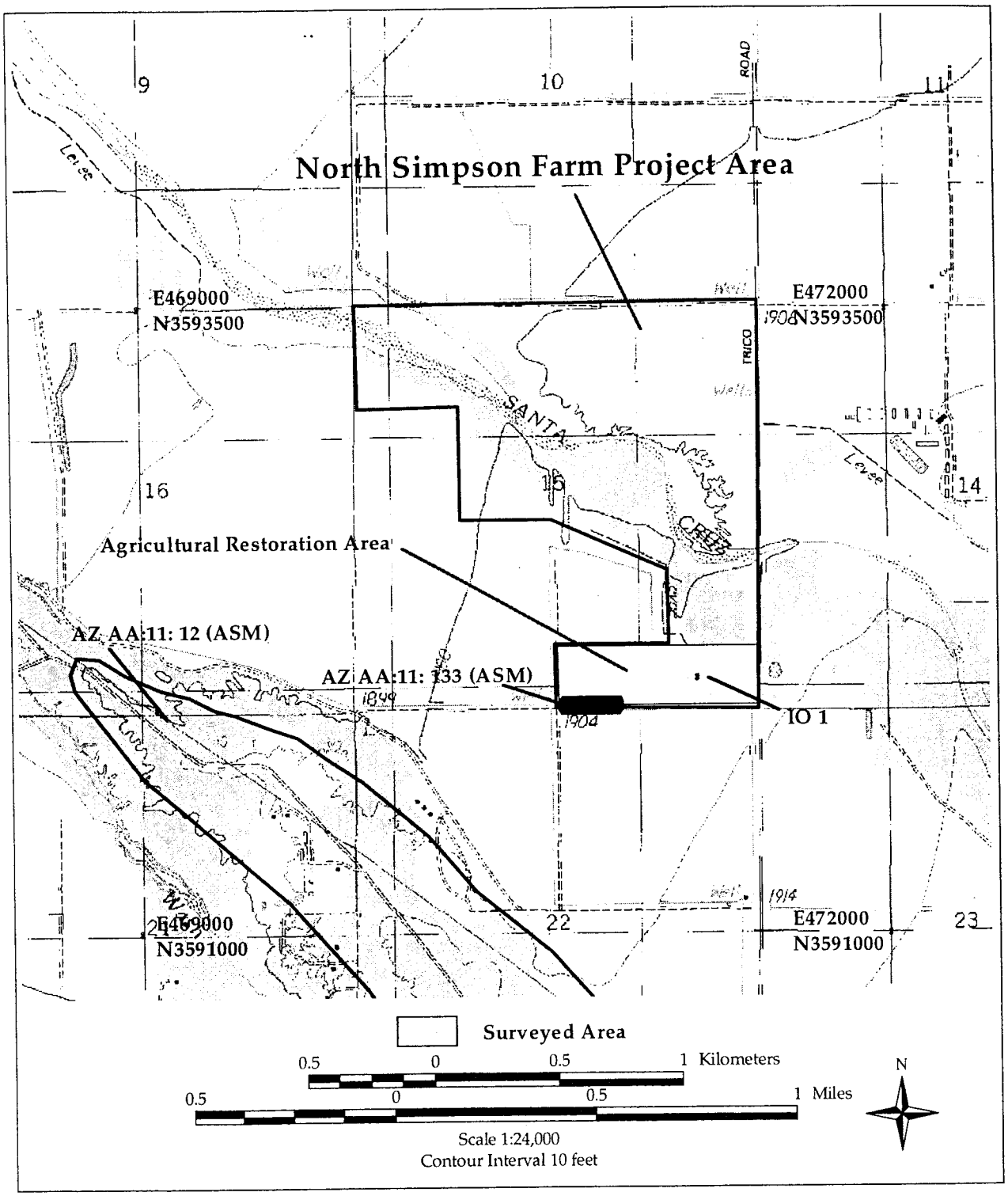

Figure 1. Portion of USGS 7.5' topographic quad West of Marana, Ariz. (AZ AA:11 [NE]), showing location of project area, isolated occurrence (IO), and nearby archaeological sites. Four UTM registration points are labeled on map.

The North Simpson Farm is part of 23,000 acres of Avra Valley farmland purchased by the City of Tucson in the 1970s and 1980s. The City of Tucson purchased the land to obtain associated water rights and retired the land from agricultural use at that time. Fifteen hundred acres of this land include the abandoned farmland of the North Simpson Farm, the Simpson Farm, and the Santa Cruz Farm. Currently, the Tucson Audubon Society is planning to restore 50 acres of abandoned farmland southwest of the river channel on the North Simpson Farm (Figure 1). Restoration efforts will include rainwater harvesting, seed pelletization and distribution, and planting of trees, shrubs, and cacti along the river channel and in the adjacent floodplain where farming once occurred. Soil sampling is also planned and will consist of scooping at least 30 one-liter samples from the ground surface. Specific work sites and associated fencing, rainwater harvesting, soil sampling, and planting locations will be selected in each area based on the results of restoration site assessments. Ground disturbance is expected to be minimal and limited to the upper six in of sediment. Root disturbance from planted trees, shrubs, and cacti will most likely be limited to the upper one m of sediment. However, the taproot of planted trees may also disturb a narrow area several meters below the modern ground surface.

Restoration efforts are designed so that the results of these approaches can be compared to non-restored acreage at the site. Restored areas of the site will be monitored for a minimum of five years to determine the success of the approaches used. Restoration work will serve as a test case for more extensive restoration at the North Simpson Farm. Habitat improvements at the North Simpson Farm will augment the abundance of bird species in the area, many of which have been observed at an aging pecan orchard owned by Herb Kai located .25 mi north of the project area. Over 150 species have been reported at the orchard in the past seven years.

The Area of Potential Effects (after 36 CFR 800.2[c]) for the immediate restoration project includes an approximately 50-acre area of retired agricultural land southwest of the river (Figure 1). During restoration activities, ground disturbance will be limited to the upper six in of recent sediment. Root disturbance from planted trees, shrubs, and cacti will most likely be limited to the upper one m of sediment. However, the taproot of planted trees may also disturb a narrow area several meters below the modern ground surface. Visual impacts to the area will not be immediately apparent but will eventually involve an overall increase in vegetative cover.

ENVIRONMENTAL SETTING OF THE PROJECT AREA

The North Simpson Farm site is located along an approximately 2.1 km (1.28 mi) stretch of the Santa Cruz River, at the northern end of Avra Valley, approximately 8 km (5 mi) upstream of the confluence of the Santa Cruz River and Los Robles Wash (Figure 1). Elevation in the project area is about 1,906 ft above measured sea level. In the absence of storm events, flow in this portion of the Santa Cruz River is predominantly treated effluent water released from the Ina and Roger road treatment plants, located approximately 28.9 km (18 mi) upstream in the City of Tucson. Daily effluent flows through the site are generally less than 40 cubic ft per second. Effluent flows are generally present, except after flowing flood events that scour the channel bottom, allowing complete infiltration of effluent prior to reaching the site.

The entire North Simpson Farm site lies in the 100-year floodway and 100-year floodplain of the Santa Cruz River (Pima County Department of Transportation and Flood Control District 1996:Figure 3). A 100-year flood is a flood having a one percent chance of being equaled or

exceeded in magnitude in any given year. Contrary to popular belief, it is not a flood occurring once every 100 years. The 100-year floodplain is the area adjoining the river covered by water in the event of a 100-year flood. The 100-year floodway is the channel of a river and the adjacent areas that must be reserved in order to discharge the 100-year flood without cumulatively increasing the water surface elevation more than one ft.

Within the past 30 years, agricultural activities and natural flooding have significantly altered the surface of the project area. Before the agricultural land was retired, ground-disturbing activities included plowing, discing, and laser leveling. Currently, northern portions of the North Simpson Farm are mowed and disced by the City of Tucson to reduce the spread of tumbleweed to adjacent farms. Almost the entire North Simpson Farm project area has been inundated at least three times during recent large flood events (October 1977, October 1983, and winter 1993) (Pima County Department of Transportation and Flood Control District 1996:Figure 8). Only the southernmost portion of the project area, the current agricultural restoration area, was not inundated during these events. This southern area was protected from floodwaters by an earthen levee constructed sometime between 1973-1974 (Brad Despain, personal communication 20 November 2000). Maintenance activities were conducted on the levee after the 1993 flood.

During the 1993 flood, alluvium carried by the river was deposited just upstream and in the project area. The bridge at Trico Road was buried beneath sediment during this event. Emergency excavation of the bridge and channel up to the Pinal County line was conducted by Pima County and the Avra Valley Irrigation District to prevent future inundations in this area. This excavation work straightened a section of the river by cutting off a large meander bend in the southeast portion of the project area. Pima County subsequently put in bank protection upstream of the Trico bridge to protect the bridge during future flood events. Since the 1993 flood and excavation of the Santa Cruz River channel, down-cutting has occurred in the Santa Cruz River channel and in the northern portion of the project area. Small flood events like that seen in October 2000 have resculpted segments of the Santa Cruz River channel and deeply eroded portions of the northern project area. The height of the cutbanks in northern eroded areas is up to 2 m. These small flood events, however, do not appear to have significantly impacted other portions of the project area.

Vegetation distribution varies across the site depending upon grade, previous land use, and proximity to the river. The dominant vegetation species in the project area consist of mesquite grassland and riparian corridor willows, cottonwood, and tamarisk. Specific native species observed on the project area include honey mesquite, velvet mesquite, blue paloverde, Mexican elderberry, willow, seepwillow, cottonwood, graythorn, desert broom, burroweed, four-wing saltbush, datura, sunflowers, yellow dock, creosotebush, inky cap fungus, and various native grasses (Baker 2000). Native plants not observed in the project area which may be reintroduced include agave, prickly pear, cholla, jojoba, acacia, hackberry, bursage, fish-hook barrel cactus, and others. The project area is frequented by numerous animals including coyote, javelina, badger, bats, rodents, and possibly large cats and deer.

CULTURAL BACKGROUND OF THE PROJECT AREA

The history of the Southwest and the Tucson Basin is marked by a close relationship between people and the natural environment. Environmental conditions have strongly influenced subsistence practices and social organization, and social and cultural changes have, in turn, made

it possible to better exploit environmental resources. Through time, specialized adaptations to the arid region distinguished people living in the Southwest from those in other areas. Development of cultural and social conventions also became more regionally specific over time, and by A.D. 650 groups living in the Tucson Basin can be readily differentiated from those living in other areas of the Southwest. Today, the harsh desert climate no longer isolates Tucson and its inhabitants, but life remains closely tied to the unique resources of the Southwest. Table 1 summarizes the chronology of the Tucson Basin.

Table 1. Periodization and chronology of the Santa Cruz Valley-Tucson Basin prehistory.

Periods	Phases	Date Ranges
Historic	American Statehood period	A.D. 1912-present
	American Territorial period	A.D. 1854-1912
	Spanish-Mexican period	A.D. 1697-1854
Protohistoric		A.D. 1450-1697
Hohokam Classic	Tucson	A.D. 1300-1450?
	Tanque Verde	A.D. 1150-1300
Hohokam Sedentary	Late Rincon	A.D. 1100-1150
	Middle Rincon	A.D. 1000-1100
	Early Rincon	A.D. 950-1000
Hohokam Colonial	Rillito	A.D. 850-950
	Cañada del Oro	A.D. 750-850
Hohokam Pioneer	Snaketown	A.D. 700-750
	Sweetwater	A.D. 675-700
	Estrella	A.D. 650-675
Early Ceramic	Tortolita	A.D. 550-650
	Agua Caliente	A.D. 150-550
Early Agricultural	Late Cienega	400 B.C.-A.D. 150
	Early Cienega	800-400 B.C.
	San Pedro	1200-800 B.C.
	Unnamed	1700-1200 B.C.
Archaic	Chiricahua	3000-1700 B.C.
	(Occupation gap?)	6000-3000 B.C.
	Sulphur Springs-Ventana	8500-6000 B.C.
Paleoindian		10,000?-8500 B.C.

Paleoindian Period (10,000?-8500 B.C.)

Archaeological investigations suggest that the Tucson Basin was initially occupied some 10,000 years ago, a time much wetter and cooler than today. The Paleoindian period is characterized by small, mobile groups of hunter-gatherers who briefly occupied temporary campsites as they moved across the countryside in search of food and other resources (Cordell 1997:67). The hunting of large mammals, such as mammoth and bison, was a particular focus of the subsistence economy. A Clovis point characteristic of the Paleoindian period (circa 9500 B.C.) was collected from the Valencia site, located along the Santa Cruz River in the southern Tucson Basin (Doelle 1985:181-182). Another Paleoindian point was found in Rattlesnake Pass in the northern Tucson Basin (Huckell 1982). These rare finds suggest that prehistoric use of the Tucson area probably began at this time. Paleoindian use of the Tucson Basin is supported by archaeological investigations in the

nearby San Pedro Valley and elsewhere in southern Arizona, where Clovis points in association with extinct mammoth and bison remains have been discovered (Huckell 1992, 1995). However, because Paleoindian sites have yet to be found in the Tucson Basin, the extent and intensity of this occupation are unknown.

Archaic Period (8500-1700 B.C.)

The transition from the Paleoindian period to the Archaic period was accompanied by marked climatic changes. During this time, the environment came to look much like it does today. Archaic period groups pursued a mixed subsistence strategy characterized by intensive wild plant gathering and the hunting of small animals. The only Early Archaic period (8500-5000 B.C.) site known from the Tucson Basin region was found in Ruelas Canyon, south of the Tortolita Mountains (Swartz 1998:24). However, Middle Archaic period sites dating between 5000 and 1500 B.C. are known from the bajada zone surrounding Tucson, and, to a lesser extent, from floodplain and mountain areas. Recent investigations conducted at Middle Archaic period sites include excavations along the Santa Cruz River (Gregory 1999), in the northern Tucson Basin (Roth 1989), at the La Paloma development (Dart 1986), and along Ventana Canyon Wash and Sabino Creek (Dart 1984; Douglas and Craig 1986). Archaic period sites in the Santa Cruz floodplain were found to be deeply buried by alluvial sediments, suggesting that more of these sites are present but undiscovered because of the lack of surface evidence.

Early Agricultural Period (1,700 B.C.-A.D. 150)

The Early Agricultural period (previously known as the Late Archaic period) was the time when domesticated plant species were first cultivated in the greater Southwest region. The exact timing of the introduction of cultigens from Mexico is not known, but maize was available in some form by approximately 1500-1200 B.C. (Gregory 2000; Wills 1988). By at least 400 B.C., groups were living in substantial agricultural settlements in the floodplain of the Santa Cruz River. Recent archaeological investigations suggest that canal irrigation also began sometime during this period.

Several Early Agricultural period sites are known from the Tucson Basin and its vicinity (Diehl 1997; Ezzo and Deaver 1998; Freeman 1998; Gregory 2000; Huckell and Huckell 1984; Huckell et al. 1995; Mabry 1998; Roth 1989). While there is variability between these sites, most likely due to the 1,550 years included in the period, all excavated sites to date contain small, round, or oval semisubterranean pithouses, many with large internal storage pits. At some sites, a larger round structure is also present, which is thought to be for communal or ritual purposes. Stylistically distinctive Cienega, Cortaro, and San Pedro type projectile points are common at Early Agricultural sites as are a range of ground stone and flaked stone tools, ornaments, and shell jewelry (Diehl 1997; Mabry 1998). The fact that shell and some of the material used for stone tools and ornaments were not locally available in the Tucson area suggests that trade networks were in operation. Agriculture, particularly the cultivation of corn, was important in the diet and increased in importance through time. However, gathered wild plants, such as tansy mustard and amaranth seeds, mesquite seeds and pods, and agave hearts, were also frequently used resources. Like the preceding Archaic period, the hunting of animals such as deer, cottontail rabbits, and jackrabbits, continued to provide an important source of protein.

Early Ceramic Period (A.D. 150-650)

Although ceramic artifacts, including figurines and crude pottery, were first produced in the Tucson Basin during the Early Agricultural period (Heidke and Ferg 2000; Heidke et al. 1998), the widespread use of ceramic containers marks the transition to the Early Ceramic period (Huckell 1992). Undecorated plain ware pottery was widely used in the Tucson Basin by around A.D. 150, marking the start of the Agua Caliente phase (A.D. 150-550), and red ware pottery was introduced to the ceramic assemblage during the subsequent Tortolita phase (A.D. 550-650). The Tortolita phase also saw the addition of a number of new pottery vessel forms, suggesting that by this time ceramics were being used for a multitude of purposes.

Architectural features became more formalized and substantial during the Early Ceramic period, representing a greater investment of effort in construction and perhaps more permanent settlement. A number of pithouse styles are present, including small, round, and basin-shaped houses, as well as slightly larger subrectangular structures. As during the Early Agricultural period, a class of significantly larger structures may have functioned in a communal or ritual manner. Reliance on agricultural crops continued to increase, and a wide variety of cultigens, including maize, beans, squash, cotton, and agave, were an integral part of the subsistence economy. Populations grew as farmers expanded their crop production to floodplain land near permanently flowing streams and it is assumed that canal irrigation systems also expanded. Evidence from archaeological excavations indicates that trade in shell, turquoise, obsidian, and other materials intensified and that new trade networks were developed.

Hohokam Sequence (A.D. 650-1450)

The Hohokam tradition developed in the deserts of central and southern Arizona sometime around A.D. 650 and is characterized by the introduction of decorated ceramics: red-on-buff wares in the Phoenix Basin and red-on-brown wares in the Tucson Basin (Doyel 1991; Wallace et al. 1995). Through time, Hohokam artisans embellished this pottery with highly distinctive geometric figures and life forms such as birds, humans, and reptiles. The Hohokam diverged from the preceding periods in a number of other important ways: pithouses were clustered into formalized courtyard groups, which in turn were organized into larger village segments, each with their own roasting area and cemetery; new burial practices appeared (cremation instead of inhumation) in conjunction with special artifacts associated with death rituals; canal irrigation systems were expanded and, particularly in the Phoenix Basin, represented huge investments of organized labor and time; and large communal or ritual features such as ballcourts and platform mounds were constructed at many village sites.

The Hohokam sequence is divided into the pre-Classic (A.D. 650-1150) and Classic (A.D. 1150-1450) periods. At the start of the pre-Classic, small pithouse hamlets and villages were clustered around the Santa Cruz River. However, beginning about A.D. 750, large, nucleated villages were established along the river or its major tributaries, with smaller settlements in outlying areas serving as seasonal camps for functionally specific tasks such as hunting, gathering, or limited agriculture (Doelle and Wallace 1991). At this time, large, basin-shaped features with earthen embankments called ballcourts were built at a number of the riverine villages. Although the exact function of these features is unknown, they probably served as arenas for playing a type of ball

game as well as places for holding religious ceremonies and for bringing different groups together for trade and other communal purposes (Wilcox 1991; Wilcox and Sternberg 1983).

Between A.D. 950 and 1150, Hohokam settlement in the Tucson area became even more dispersed, utilizing the extensive bajada zone as well as the valley floor (Doelle and Wallace 1986). An increase in population is apparent, and both functionally specific seasonal sites, as well as more permanent habitations, were now situated away from the river, although the largest sites were still on the terraces just above the Santa Cruz. At this time, there is strong archaeological evidence for increasing specialization in ceramic manufacture, with some village sites producing decorated red-on-brown ceramics for trade throughout the Tucson area (Harry 1995; Heidke 1986, 1996; Huntington 1986).

The Classic period is marked by dramatic changes in settlement patterns and possibly social organization. Above-ground adobe compound architecture appeared for the first time, supplementing, but not replacing, the traditional semisubterranean pithouse architecture (Haury 1928; Wallace 1995). Although corn agriculture was still the primary subsistence focus, extremely large Classic period rock pile field systems associated with the cultivation of agave have been found in both the northern and southern portions of the Tucson Basin (Doelle and Wallace 1991; Fish et al. 1992). Platform mounds were also constructed at a number of Tucson Basin villages sometime around A.D. 1275-1300 (Gabel 1931). These features are found throughout southern and central Arizona and consist of a central structure that was deliberately filled to support an elevated room upon a platform. The function of the elevated room is unclear; some were undoubtedly used for habitation whereas others may have been primarily ceremonial. Building a platform mound took organized and directed labor, and the mounds are believed to be symbols of a socially differentiated society (Doelle et al. 1995; Elson 1998; Fish et al. 1992; Gregory 1987). By the time platform mounds were constructed, most smaller sites had been abandoned, and Tucson Basin settlement was largely concentrated at only a half dozen large, aggregated communities. Recent research has suggested that aggregation and abandonment in the Tucson area may be related to an increase in conflict and possibly warfare (Wallace and Doelle 1998). By A.D. 1450, the Hohokam tradition, as it is presently known, disappeared from the archaeological record.

Protohistoric Period (A.D. 1450-1697)

Little is known of the period from A.D. 1450, when the Hohokam disappeared from view, to A.D. 1697, when Father Kino first traveled to the Tucson Basin (Doelle and Wallace 1990). By that time, the Tohono O'odham people were living in the arid desert regions to the west of the Santa Cruz River, and groups that lived in the San Pedro and Santa Cruz valleys were known as the Sobaipuri (Doelle and Wallace 1990; Masse 1981). Both groups spoke the Piman language and, according to historic accounts and archaeological investigations, lived in oval jacal surface dwellings rather than pithouses. One of the larger Sobaipuri communities was found at Bac, where the Spanish Jesuits and later Franciscans constructed the mission of San Xavier del Bac (Huckell 1992; Ravesloot 1987). Due to the paucity of historic documents and archaeological research, however, little can be said regarding this poorly known period.

Spanish and Mexican Periods (A.D. 1697-1854)

Spanish exploration of southern Arizona began at the end of the seventeenth century A.D. Early Spanish explorers in the Southwest noted the presence of Native Americans living in what is now the Tucson area. These groups comprised the largest concentration of population in southern Arizona (Doelle and Wallace 1990). In 1757, Father Bernard Middendorf arrived in the Tucson area, establishing the first local Spanish presence. Fifteen years later, the construction of the San Agustín Mission near a Native American village at the base of A-Mountain was initiated, and by 1773 a church was completed (Dobyns 1976:33).

In 1775, the site for the Presidio of Tucson was selected on the eastern margin of the Santa Cruz River floodplain. In 1776, Spanish soldiers from the older presidio at Tubac moved north to Tucson, and construction of defensive and residential structures was begun. The Presidio of Tucson was one of several forts built to counter the threat of Apache raiding groups that had entered the region at about the same time as the Spanish (Thiel et al. 1995; Wilcox 1981). Spanish colonists soon arrived to farm the relatively lush banks of the Santa Cruz River, to mine the surrounding hills, and to graze cattle. Many indigenous settlers were attracted to the area by the availability of Spanish products and the relative safety provided by the Presidio. The Spanish and Native American farmers grew corn, wheat, and vegetables, and cultivated fruit orchards, and the San Agustín Mission was known for its impressive gardens (Williams 1986).

In 1821, Mexico gained independence from Spain, and Mexican settlers continued farming, ranching, and mining activities in the Tucson Basin. By 1831, the San Agustín Mission had been abandoned (Elson and Doelle 1987; Hard and Doelle 1978), but settlers continued to seek the protection of the presidio walls.

American Period (1856-Present)

Through the 1848 settlement of the Mexican-American War and the 1853 Gadsden Purchase, Mexico ceded much of the Greater Southwest to the United States, establishing the international boundary at its present location. The U.S. Army established its first outpost in Tucson in 1856 and, in 1873, founded Fort Lowell at the confluence of the Tanque Verde Creek and Pantano Wash, to guard against continued Apache raiding.

Railroads arrived in Tucson and the surrounding areas in the 1880s, opening the floodgates of Anglo-American settlement. With the surrender of Geronimo in 1886, Apache raiding ended and the region's settlement boomed. Local industries associated with mining and manufacturing continued to fuel growth, and the railroad supplied the Santa Cruz River Valley with the commodities it could not produce locally. Meanwhile, homesteaders established numerous cattle ranches in outlying areas, bringing additional residents and income to the area (Mabry et al. 1994). By the turn of the century, municipal improvements to water and sewer service, and the eventual introduction of electricity, made life in southern Arizona more hospitable. New residences and businesses continued to appear within an ever-widening perimeter around Tucson, and city limits stretched to accommodate the growing population. Tourism, the health industry, and activities

centered around the University of Arizona and Davis-Monthan Air Force Base have contributed significantly to growth and development in the Tucson Basin in the twentieth century (Sonnichsen 1982).

PREVIOUS RESEARCH IN THE PROJECT AREA

A check of the site files at the Arizona State Museum (ASM) prior to fieldwork, indicated that five surveys had been conducted within a kilometer of the project area (ASM Project Registration Numbers 1985-167, 1989-165, 1995-405, 1997-414, and 2000-111). The project area lies between two large, completely surveyed areas, Marana and Los Robles, that were surveyed by the Northern Tucson Basin Survey Project (Madsen et al. 1993). One large previously recorded site (AZ AA:11:12 [ASM]) lies approximately .75 km south of the project area.

AZ AA:11:12 (ASM), also known as the Pig Farm, Five Bridges, and Silverbell site, lies on an elevated area between the floodplains of the Santa Cruz River and Los Robles Wash. The site consists of several areas of very high artifact density surrounded by a low-to-medium artifact density scatter. Central portions of site are heavily potted, revealing adobe structures and burials, both inhumations and cremations. Surface features include several deflated trash mounds. Based on ceramic identification, the site dates to the Rillito, Rincon, and Tanque Verde phases. An early ceramic component may also be present. The site has been impacted by the construction of Silverbell Road, other dirt roads, powerlines, drainage ditches, and heavy pothunting. The site also extends to modern agricultural fields which probably impacted the site area (ASM site card files).

SURVEY METHODS

The archaeological survey was conducted by Michelle Stevens and Andrew Dutt of Desert Archaeology, Inc. on 24 November 2000. The agricultural restoration area was surveyed by the archaeologists walking parallel, north-south transects, spaced 20 m apart. This survey method resulted in 100 percent coverage of the project area. The project area totaled 50 acres. Visibility on the retired agricultural land was excellent.

SURVEY RESULTS

One archaeological site, AZ AA:11:133 (ASM), and one isolated occurrence (IO), a sand-tempered plain ware sherd, were recorded in the project area.

AZ AA:11:133 (ASM) consists of a Hohokam sherd and flaked stone scatter measuring 60 m north-south by 260 m east-west. The artifact assemblage consists of 200+ sherds including plain ware and unidentified red-on-brown wares, 2+ red rhyolite flakes, and a tabular tool fragment. The site lies at the junction of two abandoned agricultural fields. A raised, concrete-lined irrigation ditch bisects the site and the two agricultural fields.

SIGNIFICANCE ASSESSMENT

National Register of Historic Places

The National Register of Historic Places is the nation's inventory of historic sites. It was established after the passage of the National Historic Preservation Act (NHPA) of 1966 to promote preservation and study of historic resources. Most projects involving federal agencies, federal land, or federal funds require evaluation and mitigation of their impacts on properties eligible for the National Register. In addition, many state and local laws, ordinances, and regulations require similar evaluations. The current project is subject to archaeological compliance under Section 106 of the NHPA because it is funded in part by a federal agency, the U.S. Fish and Wildlife Service.

In order for a property to be listed in the National Register, it must meet integrity requirements and at least one of four significance criteria. These criteria are summarized in Table 2. Except in special circumstances, properties must be at least 50 years old to be considered for inclusion in the National Register.

Table 2. National Register eligibility criteria.

The quality of significance in American history, architecture, archeology, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:
A. That are associated with events that have made a significant contribution to the broad pattern of our history; or
B. That are associated with the lives of persons significant in our past; or
C. That embody the distinctive characteristics of a type, period, or method of construction or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
D. That have yielded, or may be likely to yield, information important in prehistory or history.

Assessment of AZ AA:11:133 (ASM)

AZ AA:11:133 (ASM) meets eligibility requirements of the NRHP under Criterion D. It is considered eligible for nomination under Criterion D because it could contribute information to help develop the historic contexts of Hohokam land-use and settlement patterns in the northern Tucson Basin during the Early Ceramic, pre-Classic, and Classic periods. Its location between two classic period platform mound communities, Los Robles and Marana, may also contribute to understanding social and economic relationships between these Classic period communities.

PROJECT EFFECT

The proposed agricultural restoration project will have no effect on AZ AA:11:133 (ASM) because the Tucson Audubon Society does not plan to conduct restoration activities within the boundaries of any archaeological site discovered during this survey.

RECOMMENDATIONS

One archaeological site, AZ AA:11:133 (ASM), lies within the proposed agricultural restoration project area. This is considered eligible for nomination to the NRHP under Criterion D (information potential). Avoidance of this site is recommended.

Because no other significant cultural resources were found within the Area of Potential Effects (36CFR 800.2[c] as defined above, it is recommended that the work proceed as planned in areas outside of AZ AA:11:133 (ASM). If any archaeological materials are encountered during agricultural restoration activities, work should be halted and a professional archaeologist contacted so that the remains may be evaluated. If the project area described here is modified significantly from the locational information provided to Desert Archaeology, Inc. for the purpose of this survey, further archaeological consultation will be required prior to the initiation of the proposed work.

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APPENDIX

Arizona State Museum Archaeological Site Card

Side A

AZ AA :11 :133 (ASM)

ARIZONA STATE MUSEUM ARCHAEOLOGICAL SITE CARD

RECORDER ADMIN

Id No: _____ Recorders: Michelle Stevens / Andrew Dutt

_____ / _____ Natl Reg Opinion: Eligible

Recording Organization: Desert Archaeology, Inc. Date Recorded: 24 Nov 2000

Proj. Name: Simpson Farm Survey

Site Name: None

Land Status (check one): PVT _ CTY X CO _ ST _ TRIB _ USFS _ USFW _
NPS _ BLM _ DOD _ ACE _ BOR _ RTC _

Owner/Agency Name: City of Tucson

Survey Colls: Y____ N X Repository Inst.: _____

Report Ref: An Archaeological Survey of the Tucson Audubon Society's North Simpson Farm Agricultural Restoration Project, by M. Stevens. DAI Project Report 00-140, Desert Archaeology, Inc., Tucson, AZ.

LOCATION

Mapname USGS: West of Marana Series: 7.5' State: AZ County: Pima El: 1900 ft.

Site Size: (in Ft _ or M X) Length 260 Width 60 How Measured: Est. ___ Pace X Map _ Tape _

			BL	TWN	RNG	SC	SUBDIVISION
cntr UTM: Z 12	E 470800	N 3591915					
peri UTM: Z 12	E 470664	N 3591915	GI	11S	10E	15	S ½, SW¼, SE¼
peri UTM: Z 12	E 470800	N 3591945	GI	11S	10E	22	N ½, NW¼, NE¼
peri UTM: Z 12	E 470800	N 3591885					
peri UTM: Z 12	E 470925	N 3591915					

How were UTMs derived: USGS Map X GPS ____

INTERPRETATION

Site Description/Remarks:

AZ AA:11:133 (ASM) consists of a Hohokam sherd and flaked stone scatter measuring 60 m north-south by 260 m east-west. The artifact assemblage consists of 200+ sherds including plainware and unidentified red-on-brown wares, 2+ red rhyolite flakes, and a tabular tool fragment. The site lies at the junction of two abandoned agricultural fields. A raised, concrete-lined irrigation ditch bisects the site and the two agricultural fields

AGENCY ADMIN ASM ADMIN

Additional Documentation Type / Document Location

Agency Site No: _____ _____ in _____

Agency Proj. No: _____ _____ in _____

Natl Reg Rec: Eligible _____ in _____

ASM Site No: AZ AA : 11 : 133 (ASM) ASM Proj. No.: ____ - ____ ASM Permit No.: 2000 - 3BL

ASM USE ONLY Class: __ Within AZ _ : _ (ASM)
QP _ _ : _ Contains AZ _ : _ (ASM)
QP _ _ : _ Biblio Ref. _____ Plotted _/_/_ by ___
QP _ _ : _ Acc. No. __ - __ AZSITE DE _/_/_ by __

Corrections:

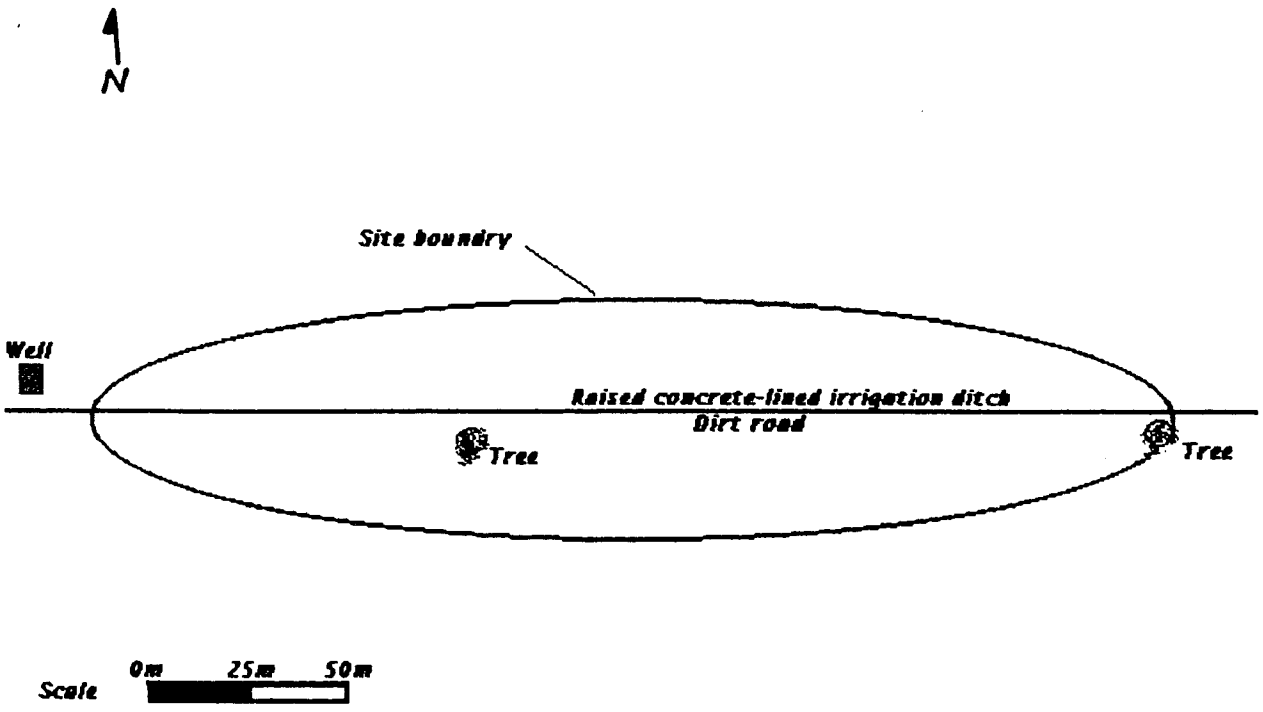
ASM Site Card Rev. 7/16/98

Side E

AZ AA :11 :133 (ASM)

ARIZONA STATE MUSEUM ARCHAEOLOGICAL SITE CARD

Plainview/Profile



An Archaeological Survey and Geoarchaeological Assessment of the Tucson Audubon Society's North Simpson Farm Riparian Recovery Project, Pima County, Arizona

Michelle N. Stevens

Reviewed by:

Patricia Castalia
Desert Archaeology, Inc.
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Project Report No. 00-155
Desert Archaeology, Inc.
(DAI Project No. 00-119B)
3975 North Tucson Boulevard, Tucson, Arizona 85716 • 10 February 2001

REPORT ABSTRACT

DATE: 10 February 2001.

AGENCY: Tucson Audubon Society, Tucson, Arizona.

PROJECT TITLE: An Archaeological Survey and Geoarchaeological Assessment of the Tucson Audubon Society's North Simpson Farm Riparian Recovery Project, Pima County, Arizona

PROJECT DESCRIPTION: An archaeological survey and geoarchaeological assessment of the ground surface in advance of a riparian restoration project along a portion of the Santa Cruz River, located at the southwest corner of Trico and Hardin roads, west of Marana, Pima County, Arizona.

PERMIT NUMBERS: Arizona State Museum Permit 2000-3bl.

LOCATION:

COUNTY: Pima.

DESCRIPTION: The project area is located at the southwest corner of Trico and Hardin roads, west of Marana in Section 15, Township 11 South, Range 10 East on USGS 7.5-minute topographic quadrangle map West of Marana, Arizona [AZ AA:11(NE)].

NUMBER OF SURVEYED ACRES: 116 acres

NUMBER OF SITES: 0

LIST OF REGISTER ELIGIBLE PROPERTIES: 0

LIST OF INELIGIBLE SITES: 0

COMMENTS: No significant archaeological resources were located. It is recommended that the project proceed as planned.

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AN ARCHAEOLOGICAL SURVEY AND GEOARCHAEOLOGICAL ASSESSMENT OF THE TUCSON AUDUBON SOCIETY'S NORTH SIMPSON FARM RIPARIAN RECOVERY PROJECT, PIMA COUNTY, ARIZONA

An archaeological survey and geoarchaeological assessment of the North Simpson Farm, west of Marana, Pima County, Arizona was requested by the Tucson Audubon Society to determine if significant cultural resources are located on the property and the potential for archaeological sites in unsurveyed portions of the property. The North Simpson Farm consists of 400 acres of retired agricultural land currently owned by the City of Tucson. Funding for the restoration work comes from the U.S. Army Corp of Engineers (COE), Arizona Water Protection Fund (AWPF), and U.S. Fish and Wildlife Service (USF&W). The COE and AWPF have funded 6 acres and 20 acres of riparian restoration work, respectively. Both the COE- and AWPF-funded riparian restoration work will occur within a 40-acre area along the Santa Cruz River (Figure 1). Results of the archaeological survey of this 40-acre area are presented in this report. USF&W-funded restoration work will occur within a 50-acre area in the southern portion of North Simpson Farm (Figure 1). An archaeological survey of that 50-acre area has recently been conducted, the results of which are presented in a separate report (Stevens 2001).

Since the entire North Simpson Farm project area may eventually be restored, the Tucson Audubon Society also requested an archaeological survey and geoarchaeological assessment of the remaining 310 acres of the North Simpson Farm, the results of which are presented here (Figure 1). Future restoration work will occur in stages based on the results of the proposed riparian and agricultural restoration work described above. Specific work sites and associated fencing, rainwater harvesting, and planting locations in current and future restoration activities will be selected based on the results of the restoration site assessments and the archaeological surveys and geoarchaeological assessment reported here and elsewhere (Stevens 2001).

The principal investigator on the project was William H. Doelle of Desert Archaeology, Inc. The archaeological survey was conducted by Michelle Stevens and Michael Brack of Desert Archaeology, Inc., under the authority of the State of Arizona General Antiquities Permit 2000-3bl. The survey was undertaken on 28 November 2000. Two isolated occurrences were recorded. The geoarchaeological assessment was conducted by Michelle Stevens between 20 and 28 November 2000. This report provides the project area location and description, environmental background, historical and archaeological background of the project area, the results of the survey, geoarchaeological assessment, and specific recommendations. All project records are curated at the Arizona State Museum (ASM).

PROJECT AREA LOCATION AND DESCRIPTION

The North Simpson Farm Riparian Recovery project is located at the southwest corner of Trico and Hardin roads, west of Marana in Section 15, Township 11 South, Range 10 East on USGS 7.5-minute topographic quadrangle map West of Marana, Arizona [AZ AA:11(NE)] (Figure 1).

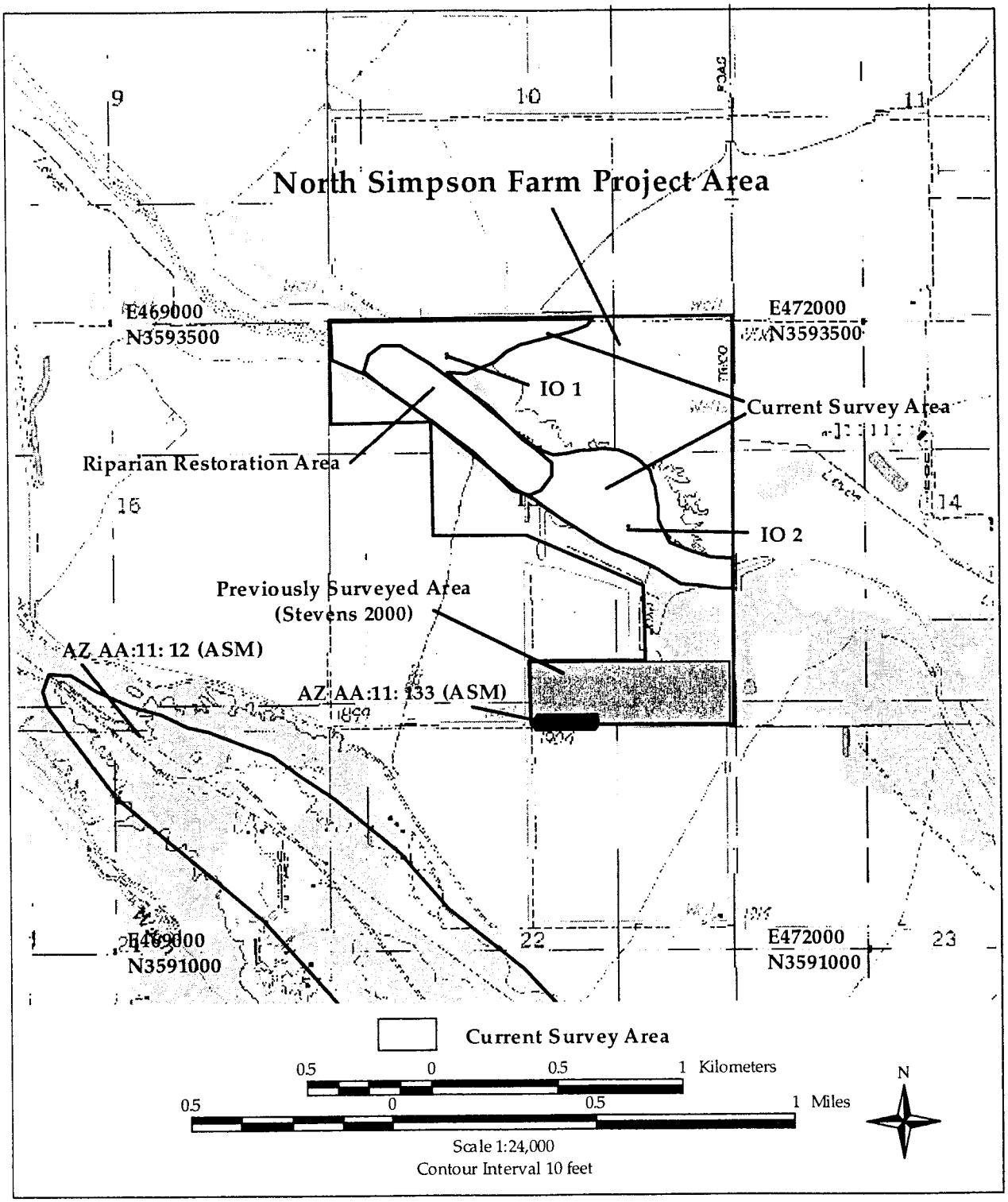

Figure 1. Portion of USGS 7.5' topographic quad West of Marana, Ariz. (AZ AA:11 [NE]), showing location of current project area, surveyed area, isolated occurrences (IOs), and nearby archaeological sites. Four UTM registration points are labeled on map.

The North Simpson Farm is part of 23,000 acres of Avra Valley farmland purchased by the City of Tucson in the 1970s and 1980s. The City of Tucson purchased the land to obtain associated water rights and retired the land from agricultural use at that time. Fifteen hundred acres of this land include the abandoned farmland of the North Simpson Farm, the Simpson Farm, and the Santa Cruz Farm. Currently, the Tucson Audubon Society is planning to restore 26 acres of the riparian habitat (COE- and AWPF-funded work) within a 40-acre area along the Santa Cruz River (Figure 1). Restoration efforts will include rainwater harvesting, seed pelletization and distribution, and planting of trees, shrubs, and cacti along the river channel and in the adjacent floodplain where farming once occurred. Trees will be planted in PVC tubes measuring 4 in in diameter by 2 ft long. Soil sampling is also planned and will consist of scooping one-liter samples from the ground surface. Specific work sites and associated fencing, rainwater harvesting, soil sampling, and planting locations will be selected in each area based on the results of restoration site assessments. Ground disturbance is expected to be minimal and limited to the upper two ft of sediment. Most of the ground disturbance, however, will probably occur in the upper six inches. Root disturbance from planted trees, shrubs, and cacti will most likely be limited to the upper one m of sediment. However, the taproot of planted trees may also disturb a narrow area several meters below the modern ground surface.

Restoration efforts are designed so that the results of these approaches can be compared to non-restored acreage at the site. Restored areas of the site will be monitored for a minimum of five years to determine the success of the approaches used. Restoration work will serve as a test case for more extensive restoration at the North Simpson Farm. Habitat improvements at the North Simpson Farm will augment the abundance of bird species in the area, many of which have been observed at an aging pecan orchard owned by Herb Kai located .25 mi north of the project area. Over 150 species have been reported at the orchard in the past seven years.

The Area of Potential Effects (after 36 CFR 800.2[c]) for the proposed riparian restoration project totals 350 acres of the North Simpson Farm. It includes an approximately 40-acre area along the Santa Cruz River in which 26-acres will be rehabilitated and a 310-acre area where future restoration activities may occur (Figure 1). During current and future restoration activities, ground disturbance will be limited to the upper two ft of recent sediment. Root disturbance from planted trees, shrubs, and cacti will most likely be limited to the upper one m of sediment. However, the taproot of planted trees may also disturb a narrow area several meters below the modern ground surface. Visual impacts to the area will not be immediately apparent, but will eventually involve an overall increase in vegetative cover.

ENVIRONMENTAL SETTING OF THE PROJECT AREA

The North Simpson Farm site is located along an approximately 2.1 km (1.28 mi) stretch of the Santa Cruz River, at the northern end of Avra Valley, approximately 8 km (5 mi) upstream of the confluence of the Santa Cruz River and Los Robles Wash (Figure 1). Elevation in the project area is about 1,906 ft above measured sea level. In the absence of storm events, flow in this portion of the Santa Cruz River is predominantly treated effluent water released from the Ina and Roger Road treatment plants, located approximately 28.9 km (18 mi) upstream in the City of Tucson. Daily effluent flows through the site are generally less than 40 cubic ft per second. Effluent flows are generally present, except after flowing flood events that scour the channel bottom, allowing complete infiltration of effluent prior to reaching the site.

The entire North Simpson Farm site lies in the 100-year floodway and 100-year floodplain of the Santa Cruz River (Pima County Department of Transportation and Flood Control District 1996:Figure 3). A 100-year flood is a flood having a one percent chance of being equaled or exceeded in magnitude in any given year. Contrary to popular belief, it is not a flood occurring once every 100 years. The 100-year floodplain is the area adjoining the river covered by water in the event of a 100-year flood. The 100-year floodway is the channel of a river and the adjacent areas that must be reserved in order to discharge the 100-year flood without cumulatively increasing the water surface elevation more than one ft.

Within the past 30 years, agricultural activities and natural flooding have significantly altered the surface of the project area. Before the agricultural land was retired, ground-disturbing activities included plowing, discing, and laser leveling. Currently, portions of the project area are mowed and disced by the City of Tucson to reduce the spread of tumbleweed to adjacent farms. Almost the entire project area has been inundated at least three times during recent large flood events (October 1977, October 1983, and winter 1993) (Pima County Department of Transportation and Flood Control District 1996:Figure 8). Only the southernmost portion of the North Simpson Farm was not inundated during these events. This southern area was protected from floodwaters by an earthen levee constructed sometime between 1973-1974 (Brad Despain, personal communication 20 November 2000). Maintenance activities were conducted on the levee after the 1993 flood.

During the 1993 flood, alluvium carried by the river was deposited just upstream and in the project area. The bridge at Trico Road was buried beneath sediment during this event. Emergency excavation of the bridge and channel up to the Pinal County line was conducted by Pima County and the Avra Valley Irrigation District to prevent future inundations in this area. This excavation work straightened a section of the river by cutting off a large meander bend in the southeast portion of the project area. Pima County subsequently put in bank protection upstream of the Trico bridge to protect the bridge during future flood events. Since the 1993 flood and excavation of the Santa Cruz River channel, down-cutting has occurred in the Santa Cruz River channel and in the northern portion of the project area. Small flood events like that seen in October 2000 have resculpted segments of the Santa Cruz River channel and deeply eroded portions of the northern project area. The height of the cutbanks in northern eroded areas is up to 2 m. These small flood events, however, do not appear to have significantly impacted other portions of the project area.

Vegetation distribution varies across the site depending upon grade, previous land use, and proximity to the river. The dominant vegetation species in the project area consist of mesquite grassland and riparian corridor willows, cottonwood, and tamarisk. Specific native species observed on the project area include honey mesquite, velvet mesquite, blue paloverde, Mexican elderberry, willow, seepwillow, cottonwood, graythorn, desert broom, burroweed, four-wing saltbush, datura, sunflowers, yellow dock, creosotebush, inky cap fungus, and various native grasses (Baker 2000). Native plants not observed in the project area which may be reintroduced include agave, prickly pear, cholla, jojoba, acacia, hackberry, bursage, fish-hook barrel cactus, and others. The project area is frequented by numerous animals including coyote, javelina, badger, bats, rodents, and possibly large cats and deer.

CULTURAL BACKGROUND OF THE PROJECT AREA

The history of the Southwest and the Tucson Basin is marked by a close relationship between people and the natural environment. Environmental conditions have strongly influenced subsistence practices and social organization, and social and cultural changes have, in turn, made it possible to better exploit environmental resources. Through time, specialized adaptations to the arid region distinguished people living in the Southwest from those in other areas. Development of cultural and social conventions also became more regionally specific over time, and by A.D. 650 groups living in the Tucson Basin can be readily differentiated from those living in other areas of the Southwest. Today, the harsh desert climate no longer isolates Tucson and its inhabitants, but life remains closely tied to the unique resources of the Southwest. Table 1 summarizes the chronology of the Tucson Basin.

Table 1. Periodization and chronology of the Santa Cruz Valley-Tucson Basin prehistory.

Periods	Phases	Date Ranges
Historic	American Statehood period	A.D. 1912-present
	American Territorial period	A.D. 1854-1912
	Spanish-Mexican period	A.D. 1697-1854
Protohistoric		A.D. 1450-1697
Hohokam Classic	Tucson	A.D. 1300-1450?
	Tanque Verde	A.D. 1150-1300
Hohokam Sedentary	Late Rincon	A.D. 1100-1150
	Middle Rincon	A.D. 1000-1100
	Early Rincon	A.D. 950-1000
Hohokam Colonial	Rillito	A.D. 850-950
	Cañada del Oro	A.D. 750-850
Hohokam Pioneer	Snaketown	A.D. 700-750
	Sweetwater	A.D. 675-700
	Estrella	A.D. 650-675
Early Ceramic	Tortolita	A.D. 550-650
	Agua Caliente	A.D. 150-550
Early Agricultural	Late Cienega	400 B.C.-A.D. 150
	Early Cienega	800-400 B.C.
	San Pedro	1200-800 B.C.
	Unnamed	1700-1200 B.C.
Archaic	Chiricahua	3000-1700 B.C.
	(Occupation gap?)	6000-3000 B.C.
	Sulphur Springs-Ventana	8500-6000 B.C.
Paleoindian		10,000?-8500 B.C.

Paleoindian Period (10,000?-8500 B.C.)

Archaeological investigations suggest that the Tucson Basin was initially occupied some 10,000 years ago, a time much wetter and cooler than today. The Paleoindian period is characterized by small, mobile groups of hunter-gatherers who briefly occupied temporary campsites as they moved across the countryside in search of food and other resources (Cordell 1997:67). The hunting of large mammals, such as mammoth and bison, was a particular focus of the subsistence economy. A Clovis point characteristic of the Paleoindian period (circa 9500 B.C.) was collected from the Valencia site, located along the Santa Cruz River in the southern Tucson Basin (Doelle 1985:181-182). Another Paleoindian point was found in Rattlesnake Pass in the northern Tucson Basin (Huckell 1982). These rare finds suggest that prehistoric use of the Tucson area probably began at this time. Paleoindian use of the Tucson Basin is supported by archaeological investigations in the nearby San Pedro Valley and elsewhere in southern Arizona, where Clovis points in association with extinct mammoth and bison remains have been discovered (Huckell 1992, 1995). However, because Paleoindian sites have yet to be found in the Tucson Basin, the extent and intensity of this occupation are unknown.

Archaic Period (8500-1700 B.C.)

The transition from the Paleoindian period to the Archaic period was accompanied by marked climatic changes. During this time, the environment came to look much like it does today. Archaic period groups pursued a mixed subsistence strategy characterized by intensive wild plant gathering and the hunting of small animals. The only Early Archaic period (8500-5000 B.C.) site known from the Tucson Basin region was found in Ruelas Canyon, south of the Tortolita Mountains (Swartz 1998:24). However, Middle Archaic period sites dating between 5000 and 1500 B.C. are known from the bajada zone surrounding Tucson, and, to a lesser extent, from floodplain and mountain areas. Recent investigations conducted at Middle Archaic period sites include excavations along the Santa Cruz River (Gregory 1999), in the northern Tucson Basin (Roth 1989), at the La Paloma development (Dart 1986), and along Ventana Canyon Wash and Sabino Creek (Dart 1984; Douglas and Craig 1986). Archaic period sites in the Santa Cruz floodplain were found to be deeply buried by alluvial sediments, suggesting that more of these sites are present but undiscovered because of the lack of surface evidence.

Early Agricultural Period (1,700 B.C.-A.D. 150)

The Early Agricultural period (previously known as the Late Archaic period) was the time when domesticated plant species were first cultivated in the greater Southwest region. The exact timing of the introduction of cultigens from Mexico is not known, but maize was available in some form by approximately 1500-1200 B.C. (Gregory 2000; Wills 1988). By at least 400 B.C., groups were living in substantial agricultural settlements in the floodplain of the Santa Cruz River. Recent archaeological investigations suggest that canal irrigation also began sometime during this period.

Several Early Agricultural period sites are known from the Tucson Basin and its vicinity (Diehl 1997; Ezzo and Deaver 1998; Freeman 1998; Gregory 2000; Huckell and Huckell 1984; Huckell et al. 1995; Mabry 1998; Roth 1989). While there is variability between these sites, most likely due to the 1,550 years included in the period, all excavated sites to date contain small, round, or oval

semisubterranean pithouses, many with large internal storage pits. At some sites, a larger round structure is also present, which is thought to be for communal or ritual purposes. Stylistically distinctive Cienega, Cortaro, and San Pedro type projectile points are common at Early Agricultural sites as are a range of ground stone and flaked stone tools, ornaments, and shell jewelry (Diehl 1997; Mabry 1998). The fact that shell and some of the material used for stone tools and ornaments were not locally available in the Tucson area suggests that trade networks were in operation. Agriculture, particularly the cultivation of corn, was important in the diet and increased in importance through time. However, gathered wild plants, such as tansy mustard and amaranth seeds, mesquite seeds and pods, and agave hearts, were also frequently used resources. Like the preceding Archaic period, the hunting of animals such as deer, cottontail rabbits, and jackrabbits, continued to provide an important source of protein.

Early Ceramic Period (A.D. 150-650)

Although ceramic artifacts, including figurines and crude pottery, were first produced in the Tucson Basin during the Early Agricultural period (Heidke and Ferg 2000; Heidke et al. 1998), the widespread use of ceramic containers marks the transition to the Early Ceramic period (Huckell 1992). Undecorated plain ware pottery was widely used in the Tucson Basin by around A.D. 150, marking the start of the Agua Caliente phase (A.D. 150-550), and red ware pottery was introduced to the ceramic assemblage during the subsequent Tortolita phase (A.D. 550-650). The Tortolita phase also saw the addition of a number of new pottery vessel forms, suggesting that by this time ceramics were being used for a multitude of purposes.

Architectural features became more formalized and substantial during the Early Ceramic period, representing a greater investment of effort in construction and perhaps more permanent settlement. A number of pithouse styles are present, including small, round, and basin-shaped houses, as well as slightly larger subrectangular structures. As during the Early Agricultural period, a class of significantly larger structures may have functioned in a communal or ritual manner. Reliance on agricultural crops continued to increase, and a wide variety of cultigens, including maize, beans, squash, cotton, and agave, were an integral part of the subsistence economy. Populations grew as farmers expanded their crop production to floodplain land near permanently flowing streams and it is assumed that canal irrigation systems also expanded. Evidence from archaeological excavations indicates that trade in shell, turquoise, obsidian, and other materials intensified and that new trade networks were developed.

Hohokam Sequence (A.D. 650-1450)

The Hohokam tradition developed in the deserts of central and southern Arizona sometime around A.D. 650 and is characterized by the introduction of decorated ceramics: red-on-buff wares in the Phoenix Basin and red-on-brown wares in the Tucson Basin (Doyel 1991; Wallace et al. 1995). Through time, Hohokam artisans embellished this pottery with highly distinctive geometric figures and life forms such as birds, humans, and reptiles. The Hohokam diverged from the preceding periods in a number of other important ways: pithouses were clustered into formalized courtyard groups, which in turn were organized into larger village segments, each with their own roasting area and cemetery; new burial practices appeared (cremation instead of inhumation) in conjunction with special artifacts associated with death rituals; canal irrigation systems were expanded and,

particularly in the Phoenix Basin, represented huge investments of organized labor and time; and large communal or ritual features such as ballcourts and platform mounds were constructed at many village sites.

The Hohokam sequence is divided into the pre-Classic (A.D. 650-1150) and Classic (A.D. 1150-1450) periods. At the start of the pre-Classic, small pithouse hamlets and villages were clustered around the Santa Cruz River. However, beginning about A.D. 750, large, nucleated villages were established along the river or its major tributaries, with smaller settlements in outlying areas serving as seasonal camps for functionally specific tasks such as hunting, gathering, or limited agriculture (Doelle and Wallace 1991). At this time, large, basin-shaped features with earthen embankments called ballcourts were built at a number of the riverine villages. Although the exact function of these features is unknown, they probably served as arenas for playing a type of ball game as well as places for holding religious ceremonies and for bringing different groups together for trade and other communal purposes (Wilcox 1991; Wilcox and Sternberg 1983).

Between A.D. 950 and 1150, Hohokam settlement in the Tucson area became even more dispersed, utilizing the extensive bajada zone as well as the valley floor (Doelle and Wallace 1986). An increase in population is apparent, and both functionally specific seasonal sites, as well as more permanent habitations, were now situated away from the river, although the largest sites were still on the terraces just above the Santa Cruz. At this time, there is strong archaeological evidence for increasing specialization in ceramic manufacture, with some village sites producing decorated red-on-brown ceramics for trade throughout the Tucson area (Harry 1995; Heidke 1986, 1996; Huntington 1986).

The Classic period is marked by dramatic changes in settlement patterns and possibly social organization. Above-ground adobe compound architecture appeared for the first time, supplementing, but not replacing, the traditional semisubterranean pithouse architecture (Haury 1928; Wallace 1995). Although corn agriculture was still the primary subsistence focus, extremely large Classic period rock pile field systems associated with the cultivation of agave have been found in both the northern and southern portions of the Tucson Basin (Doelle and Wallace 1991; Fish et al., eds. 1992). Platform mounds were also constructed at a number of Tucson Basin villages sometime around A.D. 1275-1300 (Gabel 1931). These features are found throughout southern and central Arizona and consist of a central structure that was deliberately filled to support an elevated room upon a platform. The function of the elevated room is unclear; some were undoubtedly used for habitation whereas others may have been primarily ceremonial. Building a platform mound took organized and directed labor, and the mounds are believed to be symbols of a socially differentiated society (Doelle et al. 1995; Elson 1998; Fish et al. 1992; Gregory 1987). By the time platform mounds were constructed, most smaller sites had been abandoned, and Tucson Basin settlement was largely concentrated at only a half dozen large, aggregated communities. Recent research has suggested that aggregation and abandonment in the Tucson area may be related to an increase in conflict and possibly warfare (Wallace and Doelle 1998). By A.D. 1450, the Hohokam tradition, as it is presently known, disappeared from the archaeological record.

Protohistoric Period (A.D. 1450-1697)

Little is known of the period from A.D. 1450, when the Hohokam disappeared from view, to A.D. 1697, when Father Kino first traveled to the Tucson Basin (Doelle and Wallace 1990). By that time,

the Tohono O'odham people were living in the arid desert regions to the west of the Santa Cruz River, and groups that lived in.the San Pedro and Santa Cruz valleys were known as the Sobaipuri (Doelle and Wallace 1990; Masse 1981). Both groups spoke the Piman language and, according to historic accounts and archaeological investigations, lived in oval jacal surface dwellings rather than pithouses. One of the larger Sobaipuri communities was found at Bac, where the Spanish Jesuits and later Franciscans constructed the mission of San Xavier del Bac (Huckell 1992; Ravesloot 1987). Due to the paucity of historic documents and archaeological research, however, little can be said regarding this poorly known period.

Spanish and Mexican Periods (A.D. 1697-1854)

Spanish exploration of southern Arizona began at the end of the seventeenth century A.D. Early Spanish explorers in the Southwest noted the presence of Native Americans living in what is now the Tucson area. These groups comprised the largest concentration of population in southern Arizona (Doelle and Wallace 1990). In 1757, Father Bernard Middendorf arrived in the Tucson area, establishing the first local Spanish presence. Fifteen years later, the construction of the San Agustín Mission near a Native American village at the base of A-Mountain was initiated, and by 1773 a church was completed (Dobyns 1976:33).

In 1775, the site for the Presidio of Tucson was selected on the eastern margin of the Santa Cruz River floodplain. In 1776, Spanish soldiers from the older presidio at Tubac moved north to Tucson, and construction of defensive and residential structures was begun. The Presidio of Tucson was one of several forts built to counter the threat of Apache raiding groups that had entered the region at about the same time as the Spanish (Thiel et al. 1995; Wilcox 1981). Spanish colonists soon arrived to farm the relatively lush banks of the Santa Cruz River, to mine the surrounding hills, and to graze cattle. Many indigenous settlers were attracted to the area by the availability of Spanish products and the relative safety provided by the Presidio. The Spanish and Native American farmers grew corn, wheat, and vegetables, and cultivated fruit orchards, and the San Agustín Mission was known for its impressive gardens (Williams 1986).

In 1821, Mexico gained independence from Spain, and Mexican settlers continued farming, ranching, and mining activities in the Tucson Basin. By 1831, the San Agustín Mission had been abandoned (Elson and Doelle 1987; Hard and Doelle 1978), but settlers continued to seek the protection of the presidio walls.

American Period (1856-Present)

Through the 1848 settlement of the Mexican-American War and the 1853 Gadsden Purchase, Mexico ceded much of the Greater Southwest to the United States, establishing the international boundary at its present location. The U.S. Army established its first outpost in Tucson in 1856 and, in 1873, founded Fort Lowell at the confluence of the Tanque Verde Creek and Pantano Wash, to guard against continued Apache raiding.

Railroads arrived in Tucson and the surrounding areas in the 1880s, opening the floodgates of Anglo-American settlement. With the surrender of Geronimo in 1886, Apache raiding ended and the region's settlement boomed. Local industries associated with mining and manufacturing

continued to fuel growth, and the railroad supplied the Santa Cruz River Valley with the commodities it could not produce locally. Meanwhile, homesteaders established numerous cattle ranches in outlying areas, bringing additional residents and income to the area (Mabry et al. 1994). By the turn of the century, municipal improvements to water and sewer service, and the eventual introduction of electricity, made life in southern Arizona more hospitable. New residences and businesses continued to appear within an ever-widening perimeter around Tucson, and city limits stretched to accommodate the growing population. Tourism, the health industry, and activities centered around the University of Arizona and Davis-Monthan Air Force Base have contributed significantly to growth and development in the Tucson Basin in the twentieth century (Sonnichsen 1982).

PREVIOUS RESEARCH IN THE PROJECT AREA

A check of the site files at the Arizona State Museum (ASM) prior to fieldwork indicated that five surveys have been conducted within a kilometer of the current project area (ASM Project Registration Numbers 1985-167, 1989-165, 1995-405, 1997-414, and 2000-111). An additional survey on 50 acres in the southern portion of the North Simpson Farm has also recently been conducted (Stevens 2001). The project area lies between two large, completely surveyed areas, Marana and Los Robles, that were surveyed by the Northern Tucson Basin Survey Project (Madsen et al. 1993). Two previously recorded sites, AZ AA:11:12 (ASM) and AZ AA:11:133 (ASM), lie near the current project area.

AZ AA:11:12 (ASM), also known as the Pig Farm, Five Bridges, and Silverbell site, lies on an elevated area between the floodplains of the Santa Cruz River and Los Robles Wash, approximately .75 km south of the project area. The site consists of several areas of very high artifact density surrounded by a low-to-medium artifact density scatter. Central portions of site are heavily potted, revealing adobe structures and burials, both inhumations and cremations. Surface features include several deflated trash mounds. Based on ceramic identification, the site dates to the Rillito, Rincon, and Tanque Verde phases. An Early Ceramic component may also be present. The site has been impacted by the construction of Silverbell Road, other dirt roads, power lines, drainage ditches, and heavy pothunting. The site also extends to modern agricultural fields which probably impacted the site area (ASM site card files).

AZ AA:11:133 (ASM) consists of a Hohokam sherd and flaked stone scatter measuring 60 m north-south by 260 m east-west. The artifact assemblage consists of 200+ sherds including plain ware and unidentified red-on-brown wares, 2+ red rhyolite flakes, and a tabular tool fragment. The site lies at the junction of two abandoned agricultural fields. A raised, concrete-lined irrigation ditch bisects the site and the two agricultural fields (Stevens 2001).

SURVEY METHODS

The archaeological survey was conducted by Michelle Stevens and Michael Brack of Desert Archaeology, Inc. on 28 November 2000. The project area was surveyed by two archaeologists walking the cutbanks of the Santa Cruz River and eroded areas. These methods resulted in 100 percent coverage of the surveyed area. The surveyed area totaled 116 acres. Ground visibility was fair to excellent as some areas had dense riparian vegetation.

SURVEY RESULTS

No significant cultural resources were located during the current survey. However, two isolated occurrences (IOs) were recorded (Figure 1). IO 1 is a water-worn, slightly micaceous, sand-tempered plain ware sherd (Figure 1). The highly weathered condition of the sherd suggests it is not located in situ but rather was transported to its present location during recent flooding. IO 2 is a 1930-1940s liquor bottle, located in the cutbanks of the Santa Cruz approximately 1.5-2 m below the modern ground surface (Figure 1).

GEOARCHAEOLOGICAL ASSESSMENT

The ground surface of the North Simpson Farm has been significantly impacted by agricultural activities and natural flood events. Agricultural activities (plowing, discing, and laser leveling) have disturbed the upper foot of sediment. During three recent flood events, the entire project area, except for a small area in the south, has been inundated with floodwaters. A significant amount of sediment was deposited over the project area during these flood events. Until the Santa Cruz River channel was excavated and straightened in 1993, the reach of the river on the North Simpson Farm was actively aggrading, deeply burying any archaeological material that may be present in the area. This is supported by the presence of a 1930-1940s liquor bottle found in the cutbanks of the Santa Cruz approximately 1.5-2 m below the modern ground surface (IO 2) and modern trash located approximately 40 cm below the modern ground surface in the northern eroded areas.

Although a previous archaeological survey on a southern portion of the North Simpson Farm recorded an archaeological site (AZ AA:11:133 [ASM]) (Figure 1; Stevens 2001), that survey area was protected from recent flooding by a earthen levee constructed in the 1970s. As a result, it has not had recent deposition and still has the potential to yield historic and prehistoric-age materials.

RECOMMENDATIONS

Archaeological survey was conducted in eroded areas, along the Santa Cruz River channel and in in the northwest portion of the North Simpson Farm, where cutbanks expose older sediments. No significant cultural resources were found within this 116-acre area. It is recommended that the current COE- and AWPF-funded riparian restoration work and future restoration work within this surveyed area proceed as planned. The remaining 234 acres of the Area of Potential Effects (36CFR 800.2[c], as defined above, have not been surveyed. These acres lie in the active, aggrading floodplain of the Santa Cruz River. If archaeological sites are present within this unsurveyed area, they are deeply buried–probably under more than a meter of sediment. Since the proposed riparian restoration activities will be minimal and disturb only the upper two ft of recent sediments which have been disturbed by flood events and recent mowing and discing, the restoration activities proposed here will not adversely impact any archaeological sites that may be present in the area.

Furthermore, root disturbance from the proposed restoration activities will generally occur within the upper 1 m of sediment. Although taproots of planted trees have the potential to disturb sediments several meters below the modern ground surface, such disturbance is expected to be very minimal. This minimal disturbance will not significantly impact any buried archaeological sites that may be present in the area for several reasons. First, based on the sequence of deposits

exposed near the Santa Cruz channel and in other areas of the project area, the upper meter of sediment is recent and the upper 2 m of sediment in the project area post-dates the 1930-1940s. This indicates that archaeological materials in the project area are very deeply buried. Second, taproots will only disturb a very narrow column of sediment. Finally, some taproot disturbance already exists in the project area and more is likely as the natural succession of plant species occurs. Therefore, no additional archaeological work is necessary prior to these restoration activities.

However, if any archaeological materials are encountered during riparian restoration activities, work should be halted and a professional archaeologist contacted so that the remains may be evaluated. If the project area described here is modified significantly from the locational information provided to Desert Archaeology, Inc. for the purpose of this survey and geoarchaeological assessment, further archaeological consultation will be required prior to the initiation of the proposed work.

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Cultural Resources Survey of Approximately 32 Acres for the Santa Cruz Farms Project, Marana, Pima County, Arizona

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Project Report No. 05-145
Desert Archaeology, Inc.
Project No. 01-121HL
3975 N. Tucson Blvd., Tucson, AZ 85716 • 2 June 2005

ABSTRACT

DATE: 2 June 2005

AGENCY: City of Tucson

REPORT TITLE: Cultural Resources Survey of Approximately 32 Acres for the Santa Cruz Farms Project, Marana, Pima County, Arizona.

CITY OF TUCSON PROJECT NAME: Santa Cruz Farms Project

CITY OF TUCSON PROJECT NUMBER: 05-23

FUNDING LEVEL: City

PROJECT DESCRIPTION: Survey prior to fencing, the removal of trash and the locating of underground wells and utilities.

PERMIT NUMBER: Arizona Antiquities Act Blanket Permit No. 2005-007bl, Arizona State Museum Accession No. 2005-0509.

LOCATION:

County: Pima

Description: Section 22, Township 11 South, Range 10 East on the USGS 7.5-minute topographic quad West of Marana, Ariz. (AZ AA:11 [NE]).

NUMBER OF SURVEYED ACRES: Approximately 32

NUMBER OF SITES: 1

LIST OF REGISTER-ELIGIBLE PROPERTIES: AZ AA:11:12 (ASM)

LIST OF INELIGIBLE SITES: 0

COMMENTS: A cultural resources survey was conducted within the site boundaries of AZ AA:11:12 (ASM), a previously recorded National Register eligible Hohokam village and historic-period hog farm. Concrete foundations and trash from the historic period hog farm and prehistoric trash mounds, artifacts, and a roasting pit were recorded during the survey.

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CULTURAL RESOURCES SURVEY OF APPROXIMATELY 32 ACRES FOR THE SANTA CRUZ FARMS PROJECT, MARANA, PIMA COUNTY, ARIZONA

This report details the results of a cultural resources survey of approximately 32 acres for the City of Tucson Santa Cruz Farms project (City of Tucson Project No. 05-23) in Marana, Pima County, Arizona. The work was requested by the City of Tucson to determine whether future work within the project area will have any effect on significant archaeological or historical remains that may be present. William H. Doelle, Ph.D., of Desert Archaeology, Inc., is the Principal Investigator for the project. Ellen Ruble and Mike Lindeman of Desert Archaeology conducted the field survey on 12 May 2005, working under the authority of Arizona Antiquities Act Blanket Permit No. 2005-007bl (Arizona State Museum Accession No. 2005-0509). A large prehistoric site that meets eligibility requirements of the National Register of Historic Places (National Register) called the Hog Farm Site (AZ AA:11:12 [ASM]), is located within the boundaries of the surveyed parcel. Historic-period components of the hog farm, for which the prehistoric site was named, were present within the project area as well. This report provides a description of the project area, its historical and archaeological background, results of the survey, and recommendations for future work at the site. Additional project records are curated at the Arizona State Museum (ASM).

PROJECT AREA LOCATION AND DESCRIPTION

The project is located west of the town of Marana, Pima County, Arizona. The 32-acre triangular-shaped parcel is situated just east of Silverbell Road and approximately .5 mile (.8 km) north of West Trico-Marana Road (Figure 1). Specifically, the area is within the SW ¼ and the NW¼ of the NW¼ of Section 22, Township 11 East, Range 10 South of the USGS 7.5-minute topographic quad West of Marana, Pima County, Arizona.

Area of Potential Effects (APE) refers to the "geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist" (36 CFR 800.16[d]). The APE for this project includes the entire parcel. Indirect impacts would be of concern only if standing historic properties were present in the immediate area. None are located within or near the project area.

ENVIRONMENTAL SETTING OF THE PROJECT AREA

The project area is located less than .5 mile (.8 km) northeast of a large seasonal wash named Los Robles. It is less than .75 mile (1.2 km) southwest of the Santa Cruz River, the major drainage in the area. Along the western half of the parcel are Pleistocene terraces, and in the northern end is a high ridge. Plant life in the northern Avra Valley is characterized by

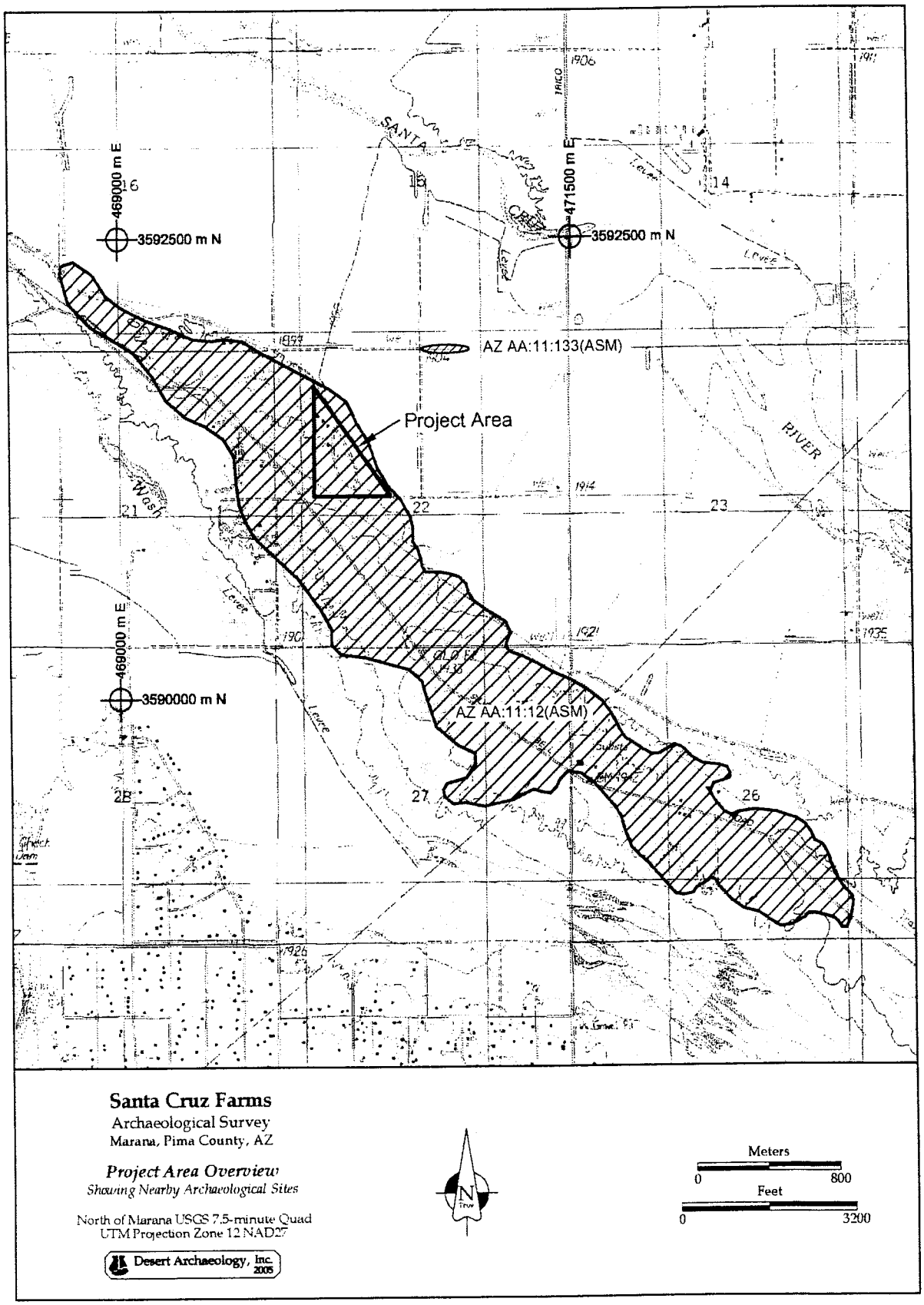

Figure 1. Reproduction of USGS 7.5-minute topographic quad Marana West, Ariz. (AZ AA:11 [NE]), showing project area and archaeological sites in the vicinity.

mesquite bosques and native cacti. In the immediate vicinity of the project area, the vegetation consists of a mixture of creosotebush and grasses interspersed with the occasional barrel or prickly pear cactus. The elevation of the project area is 582 km (1,910 ft) above mean sea level.

CULTURAL BACKGROUND OF THE PROJECT AREA

The history of the Southwest and of the Tucson Basin is marked by a close relationship between people and the natural environment. Environmental conditions have strongly influenced subsistence practices and social organization, and social and cultural changes have, in turn, made it possible to more efficiently exploit environmental resources. Through time, specialized adaptations to the arid region distinguished people living in the Southwest from those in other areas. Development of cultural and social conventions also became more regionally specific, and by A.D. 650, groups living in the Tucson Basin can be readily differentiated from those living in other areas of the Southwest. Today, the harsh desert climate no longer isolates Tucson and its inhabitants, but life remains closely tied to the unique resources of the Southwest. The chronology of the Tucson Basin is summarized in Table 1.

Table 1. Periodization and chronology of the Santa Cruz Valley-Tucson Basin prehistory.

Periods	Phases	Date Ranges
Historic		
American Statehood		A.D. 1912-present
American Territorial		A.D. 1856-1912
Spanish and Mexican		A.D. 1697-1856
Protohistoric		A.D. 1450-1697
Hohokam Classic	Tucson	A.D. 1300-1450
	Tanque Verde	A.D. 1150-1300
Hohokam Sedentary	Late Rincon	A.D. 1100-1150
	Middle Rincon	A.D. 1000-1100
	Early Rincon	A.D. 950-1000
Hohokam Colonial	Rillito	A.D. 850-950
	Cañada del Oro	A.D. 750-850
Hohokam Pioneer	Snaketown	A.D. 650/700-750
	Tortolita	A.D. 500-650/700
Early Ceramic	Late Agua Caliente	A.D. 350-500
	Early Agua Caliente	A.D. 50-350
Early Agricultural	Late Cienega	400 B.C.-A.D. 50
	Early Cienega	800-400 B.C.
	San Pedro	1200-800 B.C.
	(Unnamed)	2100-1200 B.C.
Archaic	Chiricahua	3500-2100 B.C.
	(Occupation gap?)	6500-3500 B.C.
	Sulphur Springs-Ventana	7500-6500 B.C.
Paleoindian		11,500?-7500 B.C.

Paleoindian Period (11,500?-7500 B.C.)

Archaeological investigations suggest the Tucson Basin was initially occupied some 13,000 years ago, a time much wetter and cooler than today. The Paleoindian period is characterized

by small, mobile groups of hunter-gatherers who briefly occupied temporary campsites as they moved across the countryside in search of food and other resources (Cordell 1997:67). The hunting of large mammals, such as mammoth and bison, was a particular focus of the subsistence economy. A Clovis point characteristic of the Paleoindian period (circa 9500 B.C.) was collected from the Valencia site, located along the Santa Cruz River in the southern Tucson Basin (Doelle 1985:183-184). Another Paleoindian point was found in Rattlesnake Pass, in the northern Tucson Basin (Huckell 1982). These rare finds suggest prehistoric use of the Tucson area probably began at this time. Paleoindian use of the Tucson Basin is supported by archaeological investigations in the nearby San Pedro Valley and elsewhere in southern Arizona, where Clovis points have been discovered in association with extinct mammoth and bison remains (Huckell 1993, 1995). However, because Paleoindian sites have yet to be found in the Tucson Basin, the extent and intensity of this occupation are unknown.

Archaic Period (7500-2100 B.C.)

The transition from the Paleoindian period to the Archaic period was accompanied by marked climatic changes. During this time, the environment came to look much like it does today. Archaic period groups pursued a mixed subsistence strategy, characterized by intensive wild plant gathering and the hunting of small animals. The only Early Archaic period (7500-6500 B.C.) site known from the Tucson Basin is found in Ruelas Canyon, south of the Tortolita Mountains (Swartz 1998:24). However, Middle Archaic period sites dating between 3500 and 2100 B.C. are known from the bajada zone surrounding Tucson, and, to a lesser extent, from floodplain and mountain areas. Investigations conducted at Middle Archaic period sites include excavations along the Santa Cruz River (Gregory ed. 1999), in the northern Tucson Basin (Roth 1989), at the La Paloma development (Dart 1986), and along Ventana Canyon Wash and Sabino Creek (Dart 1984; Douglas and Craig 1986). Archaic period sites in the Santa Cruz floodplain were found to be deeply buried by alluvial sediments, suggesting more of these sites are present, but undiscovered, due to the lack of surface evidence.

Early Agricultural Period (2100 B.C.-A.D. 50)

The Early Agricultural period (previously identified as the Late Archaic period) was the period when domesticated plant species were first cultivated in the Greater Southwest. The precise timing of the introduction of cultigens from Mexico is not known, although direct radiocarbon dates on maize indicate it was being cultivated in the Tucson Basin and several other parts of the Southwest by 2100 B.C. (Mabry 2005). By at least 400 B.C., groups were living in substantial agricultural settlements in the floodplain of the Santa Cruz River. Recent archaeological investigations suggest canal irrigation also began sometime during this period.

Several Early Agricultural period sites are known from the Tucson Basin and its vicinity (Diehl 1997; Ezzo and Deaver 1998; Freeman 1998; Gregory ed. 2001; Huckell and Huckell 1984; Huckell et al. 1995; Mabry 1998, 2005; Roth 1989). While there is variability among

these sites–probably due to the 2,150 years included in the period–all excavated sites to date contain small, round, or oval semisubterranean pithouses, many with large internal storage pits. At some sites, a larger round structure is also present, which is thought to be for communal or ritual purposes.

Stylistically distinctive Cienega, Cortaro, and San Pedro type projectile points are common at Early Agricultural sites, as are a range of ground stone and flaked stone tools, ornaments, and shell jewelry (Diehl 1997; Mabry 1998). The fact that shell and some of the material used for stone tools and ornaments were not locally available in the Tucson area suggests trade networks were operating. Agriculture, particularly the cultivation of corn, was important in the diet and increased in importance through time. However, gathered wild plants–such as tansy mustard and amaranth seeds, mesquite seeds and pods, and agave hearts–were also frequently used resources. As in the preceding Archaic period, the hunting of animals such as deer, cottontail rabbits, and jackrabbits, continued to provide an important source of protein.

Early Ceramic Period (A.D. 50-500)

Although ceramic artifacts, including figurines and crude pottery, were first produced in the Tucson Basin during the Early Agricultural period (Heidke and Ferg 2001; Heidke et al. 1998), the widespread use of ceramic containers marks the transition to the Early Ceramic period (Huckell 1993). Undecorated plain ware pottery was widely used in the Tucson Basin by about A.D. 50, marking the start of the early Agua Caliente phase (A.D. 50-350).

Architectural features became more formalized and substantial during the Early Ceramic period, representing a greater investment of effort in construction, and perhaps more permanent settlement. A number of pithouse styles are present, including small, round, and basin-shaped houses, as well as slightly larger subrectangular structures. As during the Early Agricultural period, a class of significantly larger structures may have functioned in a communal or ritual manner.

Reliance on agricultural crops continued to increase, and a wide variety of cultigens–including maize, beans, squash, cotton, and agave–were an integral part of the subsistence economy. Populations grew as farmers expanded their crop production to floodplain land near permanently flowing streams, and it is assumed that canal irrigation systems also expanded. Evidence from archaeological excavations indicates trade in shell, turquoise, obsidian, and other materials intensified and that new trade networks developed.

Hohokam Sequence (A.D. 500-1450)

The Hohokam tradition developed in the deserts of central and southern Arizona sometime around A.D. 500 and is characterized by the introduction of red ware and decorated ceramics: red-on-buff wares in the Phoenix Basin and red-on-brown wares in the Tucson Basin (Doyel 1991; Wallace et al. 1995). Red ware pottery was introduced to the ceramic assemblage during the Tortolita phase (A.D. 500-650/700). The addition of a number of new vessel forms suggests that, by this time, ceramics were utilized for a multitude of purposes.

Through time, Hohokam artisans embellished this pottery with highly distinctive geometric figures and life forms such as birds, humans, and reptiles. The Hohokam diverged from the preceding periods in a number of other important ways: (1) pithouses were clustered into formalized courtyard groups, which, in turn, were organized into larger village segments, each with their own roasting area and cemetery; (2) new burial practices appeared (cremation instead of inhumation) in conjunction with special artifacts associated with death rituals; (3) canal irrigation systems were expanded and, particularly in the Phoenix Basin, represented huge investments of organized labor and time; and (4) large communal or ritual features, such as ballcourts and platform mounds, were constructed at many village sites.

The Hohokam sequence is divided into the pre-Classic (A.D. 500-1150) and Classic (A.D. 1150-1450) periods. At the start of the pre-Classic, small pithouse hamlets and villages were clustered around the Santa Cruz River. However, beginning about A.D. 750, large, nucleated villages were established along the river or its major tributaries, with smaller settlements in outlying areas serving as seasonal camps for functionally specific tasks such as hunting, gathering, or limited agriculture (Doelle and Wallace 1991). At this time, large, basin-shaped features with earthen embankments, called ballcourts, were constructed at a number of the riverine villages. Although the exact function of these features is unknown, they probably served as arenas for playing a type of ball game, as well as places for holding religious ceremonies and for bringing different groups together for trade and other communal purposes (Wilcox 1991; Wilcox and Sternberg 1983).

Between A.D. 950 and 1150, Hohokam settlement in the Tucson area became even more dispersed, with people utilizing the extensive bajada zone as well as the valley floor (Doelle and Wallace 1986). An increase in population is apparent, and both functionally specific seasonal sites, as well as more permanent habitations, were now situated away from the river; however, the largest sites were still on the terraces just above the Santa Cruz. There is strong archaeological evidence for increasing specialization in ceramic manufacture at this time, with some village sites producing decorated red-on-brown ceramics for trade throughout the Tucson area (Harry 1995; Heidke 1988, 1996; Huntington 1986).

The Classic period is marked by dramatic changes in settlement patterns and possibly in social organization. Aboveground adobe compound architecture appeared for the first time, supplementing, but not replacing, the traditional semisubterranean pithouse architecture (Haury 1928; Wallace 1995). Although corn agriculture was still the primary subsistence focus, extremely large Classic period rock pile field systems associated with the cultivation of agave have been found in both the northern and southern portions of the Tucson Basin (Doelle and Wallace 1991; Fish et al. 1992).

Platform mounds were also constructed at a number of Tucson Basin villages sometime around A.D. 1275-1300 (Gabel 1931). These features are found throughout southern and central Arizona and consist of a central structure that was deliberately filled to support an elevated room upon a platform. The function of the elevated room is unclear; some were undoubtedly used for habitation, whereas others may have been primarily ceremonial. Building a platform mound took organized and directed labor, and the mounds are believed to be symbols of a socially differentiated society (Doelle et al. 1995; Elson 1998; Fish et al. 1992; Gregory 1987). By the time platform mounds were constructed, most smaller sites had

been abandoned, and Tucson Basin settlement was largely concentrated at only a half-dozen large, aggregated communities. Recent research has suggested that aggregation and abandonment in the Tucson area may be related to an increase in conflict and possibly warfare (Wallace and Doelle 1998). By A.D. 1450, the Hohokam tradition, as presently known, disappeared from the archaeological record.

Protohistoric Period (A.D. 1450-1697)

Little is known of the period from A.D. 1450, when the Hohokam disappeared from view, to A.D. 1697, when Father Kino first traveled to the Tucson Basin (Doelle and Wallace 1990). By that time, the Tohono O'odham people were living in the arid desert regions west of the Santa Cruz River, and groups that lived in the San Pedro and Santa Cruz valleys were known as the Sobaipuri (Doelle and Wallace 1990; Masse 1981). Both groups spoke the Piman language and, according to historic accounts and archaeological investigations, lived in oval jacal surface dwellings rather than pithouses. One of the larger Sobaipuri communities was located at Bac, where the Spanish Jesuits, and later the Franciscans, constructed the mission of San Xavier del Bac (Huckell 1993; Ravesloot 1987). However, due to the paucity of historic documents and archaeological research, little can be said regarding this inadequately understood period.

Spanish and Mexican Periods (A.D. 1697-1856)

Spanish exploration of southern Arizona began at the end of the seventeenth century A.D. Early Spanish explorers in the Southwest noted the presence of Native Americans living in what is now the Tucson area. These groups comprised the largest concentration of population in southern Arizona (Doelle and Wallace 1990). In 1757, Father Bernard Middendorf arrived in the Tucson area, establishing the first local Spanish presence. Fifteen years later, the construction of the San Agustín Mission near a Native American village at the base of A-Mountain was initiated, and by 1773, a church was completed (Dobyns 1976:33).

In 1775, the site for the Presidio of Tucson was selected on the eastern margin of the Santa Cruz River floodplain. In 1776, Spanish soldiers from the older presidio at Tubac moved north to Tucson, and construction of defensive and residential structures began. The Presidio of Tucson was one of several forts built to counter the threat of Apache raiding groups who had entered the region at about the same time as the Spanish (Thiel et al. 1995; Wilcox 1981). Spanish colonists soon arrived to farm the relatively lush banks of the Santa Cruz River, to mine the surrounding hills, and to graze cattle. Many indigenous settlers were attracted to the area by the availability of Spanish products and the relative safety provided by the Presidio. The Spanish and Native American farmers grew corn, wheat, and vegetables, and cultivated fruit orchards, and the San Agustín Mission was known for its impressive gardens (Williams 1986).

In 1821, Mexico gained independence from Spain, and Mexican settlers continued farming, ranching, and mining activities in the Tucson Basin. By 1831, the San Agustín Mission had been abandoned (Elson and Doelle 1987; Hard and Doelle 1978), although settlers continued to seek the protection of the Presidio walls.

American Period (1856-Present)

Through the 1848 settlement of the Mexican-American War and the 1853 Gadsden Purchase, Mexico ceded much of the Greater Southwest to the United States, establishing the international boundary at its present location. The U.S. Army established its first outpost in Tucson in 1856 and, in 1873, founded Fort Lowell at the confluence of the Tanque Verde Creek and Pantano Wash, to guard against continued Apache raiding.

Railroads arrived in Tucson and the surrounding areas in the 1880s, opening the floodgates of Anglo-American settlement. With the surrender of Geronimo in 1886, Apache raiding ended, and the region's settlement boomed. Local industries associated with mining and manufacturing continued to fuel growth, and the railroad supplied the Santa Cruz River valley with the commodities it could not produce locally. Meanwhile, homesteaders established numerous cattle ranches in outlying areas, bringing additional residents and income to the area (Mabry et al. 1994).

By the turn of the century, municipal improvements to water and sewer service, and the eventual introduction of electricity, made life in southern Arizona more hospitable. New residences and businesses continued to appear within an ever-widening perimeter around Tucson, and city limits stretched to accommodate the growing population. Tourism, the health industry, and activities centered around the University of Arizona and Davis-Monthan Air Force Base have contributed significantly to growth and development in the Tucson Basin in the twentieth century (Sonnichsen 1982).

Project Area History

Development along Silverbell Road began in the 1800s. The road is named after the Silverbell Mining District located approximately 65 km (40 miles) northwest of Tucson. Mining operations began there in the 1860s, and by the 1880s, the area had become increasingly more important to the Tucson community. Silverbell Road was constructed after 1881, when the Tucson Board of Supervisors appointed a committee to locate a direct route between Tucson and the Silverbell mining camp (Donovan 1975). By the early 1900s, the road had been improved and the entire route could be driven in just over three hours (Donovan 1975). Historic presence in the area was mainly centered on the mining town of Sasco (The Southern Arizona Smelting Company), which was founded in 1907 and folded by 1920. It was associated with the Silverbell Mine (Zaletvski 2005).

Within the immediate project area, which is just east of Silverbell Road, archival research indicates that historic-period remains are part of a hog farm. The northern half of Section 22, which includes all of the project area, was patented on 23 August 1935 to Thomas J. Smith. The land patent number 1077833 was entered as a stock-raising/homesteading patent. The earliest Pima County aerial photograph of the area dates to 8 November 1973. Some of the buildings that were recorded during this survey were already demolished by then.

PREVIOUS ARCHAEOLOGICAL RESEARCH

A records check was conducted at the Arizona State Museum and on the Internet at AZSITE. The Bureau of Land Management (BLM) provided land patent information for the section. Cultural resources survey and site information reported in this section reflects records available on 10 May 2005 at AZSITE and the Arizona State Museum.

Surveys

Seven cultural resources surveys have been conducted within 1 mile of the project area (Table 2). These included surveys for utilities (overhead and buried), a road survey, and two agricultural restoration project surveys sponsored by the Audubon Society.

Table 2. Previous cultural resource surveys conducted within 1 mile of the project area.

ASM Project No.	Project Name	Project Sponsor
1995-405	Lower Santa Cruz Survey	Pima County
1999-573	Silverbell Road Survey	Pima County Administrator's Office
2000-572	North Simpson Farms Survey	Tucson Audubon Society
2000-571	Simpson Farms Survey	Tucson Audubon Society
2000-621	Marana Circ. 15 & 16 Rebuild and Avra Valley Tie Line Project	TRICO Electric Cooperative, Inc.
1992-250	Three Points To Marana Survey	AEPCO AND BLM
2003-544	Qwest Survey along Trico Road	Qwest Communications, Inc.

Archaeological Sites

Two prehistoric sites are located within one mile of the project area (Table 3). A small site (AZ AA:11:133 [ASM]) is located approximately .25 mile (.40 km) to the northeast of the project area. The other site, referred to as the Hog Farm site (AA:11:12), completely encompasses the subject parcel (see Figure 1). Arizona State Museum and AZSITE do not include in their survey records two early mapping projects that included the Hog Farm (Downum 1993; Huntington and Holmlund 1986); however, they are discussed below. To date, the only subsurface work that has been conducted at the site has occurred outside of the project area and includes two small-scale testing projects (Heuette 1998; Lindeman 1995) and two small monitoring projects (Archer 2001; Ruble 2003). No subsurface remains were encountered during those projects.

Table 3. Previously recorded archaeological sites within 1 mile of the project area.

Site No.	Site Type	Site Age	Date Recorded
AZ AA:11:12 (ASM)	Large prehistoric Hohokam ballcourt site with at least four discrete loci.	Colonial to Classic Period (A.D. 850-1450)	11/13/84
AZ AA:11:133 (ASM)	Hohokam ceramic and lithic scatter. Approximately 200 plain ware ceramics noted.	Prehistoric	11/24/00

AZ AA:11:12 (ASM)

The Hog Farm site is the largest site in the area. It was originally recorded in 1982 by Austin and Motschall (ASM site card). It was again recorded in 1984 by J.D. Mayberry (ASM site card). It is a large prehistoric village that was occupied from the late Pioneer through the early Classic period. It extends for approximately 3.3 miles along the eastern bank of Los Robles Wash. Silverbell Road divides the site lengthwise. Current knowledge of the site comes primarily from evaluation of the surface features and artifacts (Downum 1993; Effland 1982; Huntington and Holmlund 1986). The site has been interpreted as "perhaps the paramount village in a pre-Classic settlement system" in the area (Downum 1993). This interpretation is based on the site's surface manifestations, which include trash mounds and a ballcourt (Downum 1993). The ballcourt, located in the far northeastern portion of the site, suggests a substantial pre-Classic occupation. The site's importance and the magnitude of occupation are postulated to have declined during the late Sedentary period, as the focus of occupation in the area shifted slightly to the north, to the Los Robles Mound site, AZ AA:11:25 (ASM).

Fifteen historic-period components of the Hog Farm are located within the project area and were recorded during the current survey. They consist of concrete foundations, trash pits, and a historic surface trash concentration.

AZ AA:11:133 (ASM)

This site was recorded in 2000 by Dutt and Stevens of Desert Archaeology, during the North Simpson Farm Agricultural Restoration Survey (Stevens 2001). It is located just northeast of the current project area. It was defined as a Hohokam artifact scatter that contained more than 200 plain ware sherds and unidentified Red-on-brown wares, 2 red rhyolite flakes, and a tabular tool fragment (Stevens 2001).

SURVEY METHODS AND RESULTS

The archaeological survey was conducted on 12 May 2005 by Ellen Ruble and Mike Lindeman of Desert Archaeology. Harold Maxwell (project manager) and Richard Byrd (project hydrologist) of Tucson Water accompanied the archaeologists on part of the survey.

Prior to fieldwork, digital line data depicting the project area and the ASM site boundaries of the prehistoric Hog Farm site were integrated with a geo-referenced raster image of the USGS 7.5-minute Marana West topographic map. This image was uploaded onto a Trimble GeoXT GPS receiver. The Trimble unit was used to map the features and to record attribute information. The site boundary at AZSITE is slightly different from the boundary noted in the field during the current survey. The site boundary reflected on Figures 1 and 2 of this report was published in 1993, and depicts the correct site boundary (Downum 1993).

The project area was inspected by means of pedestrian transects spaced no more than 20 meters apart (Figure 2). A portion along the western edge of the project area was not surveyed because the land ownership is disputed. The landowners have used the city's land

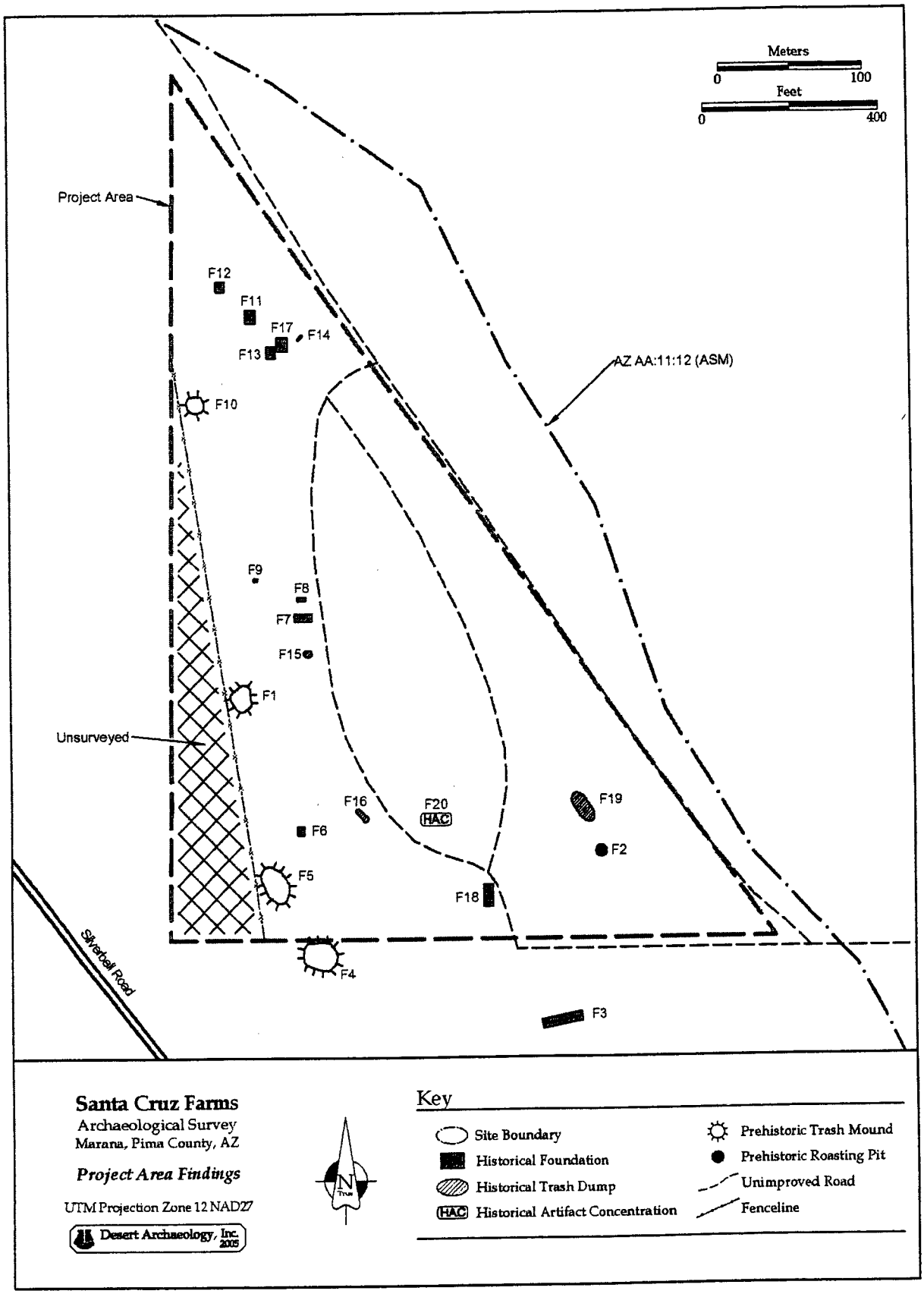

Figure 2. Map of project area showing newly recorded features.

for their purposes. One landowner mechanically excavated a large pit within this disputed area to obtain fill dirt. The confusion over the land arose because the city's fence is not placed on the property boundary (see Figure 2). Because of the high density of prehistoric artifacts and both historic-period and prehistoric features visible on the surface within the surveyed area, it is highly likely that the unsurveyed portion of the parcel contains similar surface manifestations where it has not been disturbed.

The project area has been disturbed in areas around the remnants of the historic-period hog farm. Concrete foundations, buried water and electric lines, wells, and both buried and surface trash disturbed the ground surface. Grasses were also dense in the eastern half of the parcel along the terrace's edge, limiting ground visibility.

A total of 20 features were recorded (Table 4, see Figure 2). Five of these features were prehistoric in age and the remaining 15 were historic-period in age. Feature 3 is a series of four connected concrete foundations (Figure 3). These are located outside of the project area. Feature 4 is a prehistoric trash mound (Figure 4). The majority of this feature is located outside of the project area as well.

Table 4. Features recorded during the current survey within AZ AA:11:12(ASM).

Feature No.	Type	Age	Comments
1	Trash Mound	Prehistoric	Ashy soil visible on surface of mound. Artifacts density high across the mound and around the base of the mound.
2	Roasting Pit	Prehistoric	Ashy soil with several pieces of FCR visible on the surface. Feature measures 1 m in diameter.
3	Concrete Foundation	Historic	4 concrete foundations laid out in a row
4	Trash Mound	Prehistoric	Ashy soil visible on the surface
5	Trash Mound	Prehistoric	Large sherds and flaked stone cover mound
6	Structure Concrete	Historic	Concrete trough
7	Concrete Foundation	Historic	3 concrete foundations laid out in a row
8	Concrete Foundation	Historic	3 concrete foundations laid out in a row
9	Concrete Foundation	Historic	1 concrete foundation
10	Trash Mound	Prehistoric	
11	Concrete Foundation	Historic	1 concrete foundation
12	Concrete Foundation	Historic	1 concrete foundation
13	Concrete Foundation	Historic	1 concrete foundation
14	Concrete Foundation	Historic	1 concrete foundation-linear
15	Construction Debris	Historic	Rubble mound of pressed bricks stamped with "MEXICO." An intact feature of unknown type may be buried below this mound.
16	Construction Debris	Historic	Trench partially back-filled with metal debris, cut wood beams, and tar paper
17	Concrete Foundation	Historic	1 large concrete foundation
18	Concrete Foundation	Historic	1 concrete foundation
19	Backhoe trench filled with trash	Historic	6 tires, 20 barrels (5 gallon) and 8 barrels (50 gallon)
20	Artifact Scatter	Historic	Contains approximately 50 food cans

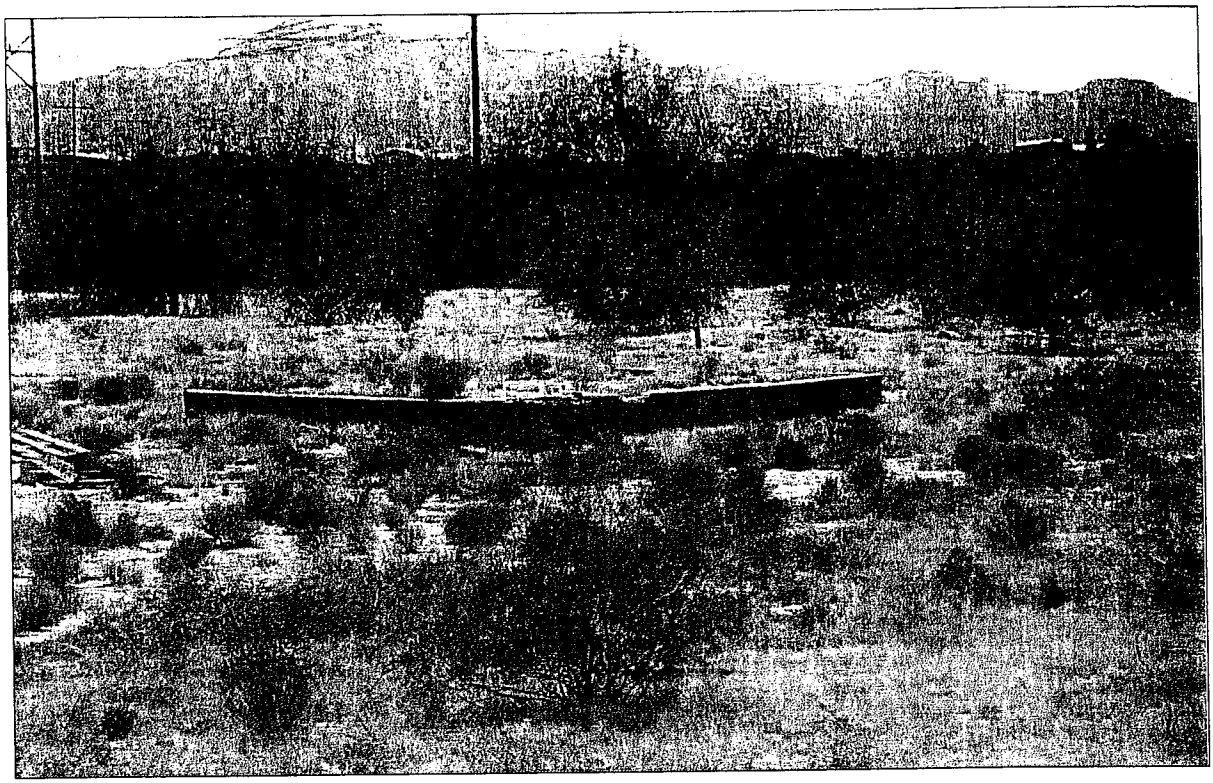

Figure 3. Photograph of part of Feature 3, a concrete foundation.

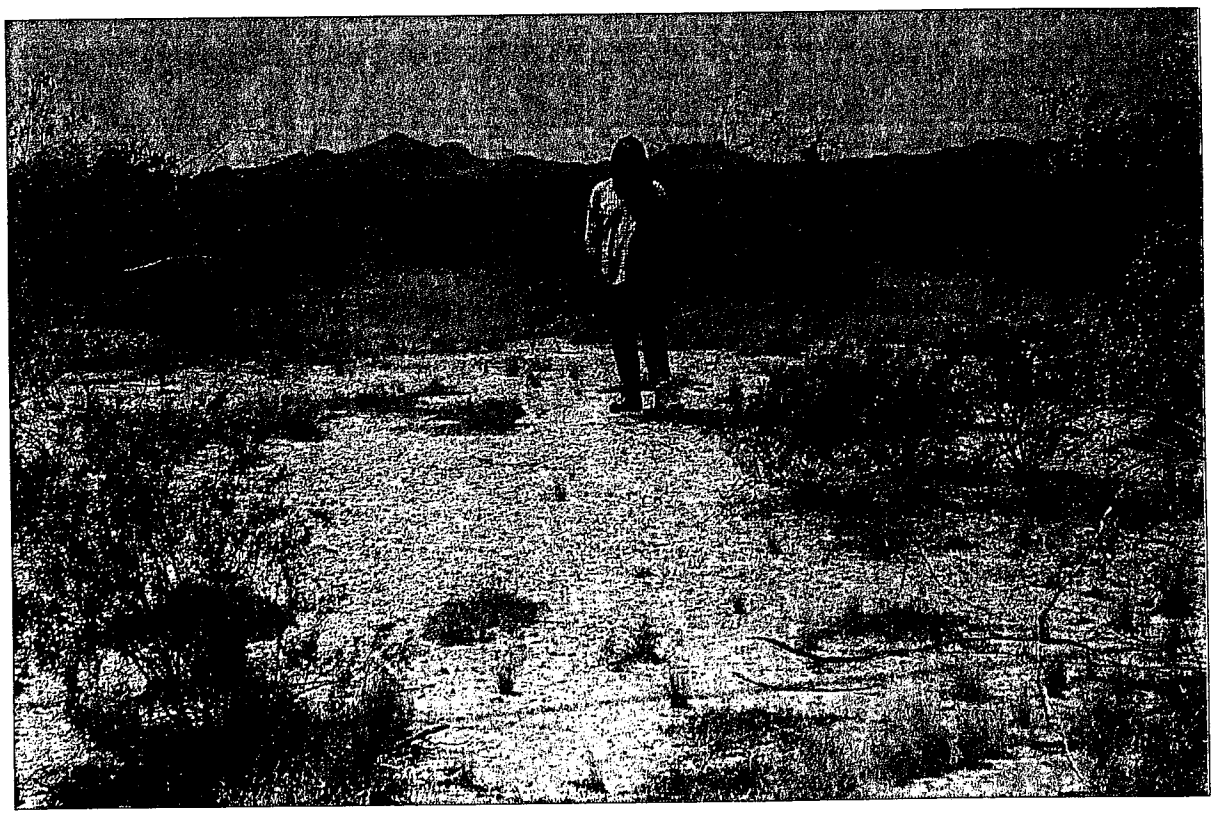

Figure 4. Photograph of Feature 4, a prehistoric trash mound.

The prehistoric features recorded in the project area are intact despite the historic hog farm construction activity. Decorated red-on-brown Middle Rincon and Tanque Verde phase ceramics and plain ware ceramics were plentiful across the project area. The density of artifacts and the size of the sherds increased on and around the trash mounds and in the western quarter of the project area on the higher terrace. On the trash mounds there were approximately 25 artifacts per m^2. On the terrace there were approximately 10 artifacts per m^2 and across the remainder of the site the number of artifacts ranged from 1 to 5 per m^2. It is highly likely that pithouses associated with the trash mounds are also located in the western portion of the project area. Several pieces of ground stone, including vesicular basalt mano and metate fragments and fine-grained basalt tabular knives, were noted. Flaked stone debitage was present in small quantities dispersed across the project area. Flaked stone materials include red jasper, gray chert, fine-grained basalt and quartzite. Fire-cracked rock was noted on the ground surface above a roasting pit (Feature 2) and on a trash mound (Feature 4). The prehistoric Hog Farm site consists of at least 5 surface artifact concentrations, called loci (Downum 1993). These were defined by the presence of trash mounds and roasting pits, and by a ballcourt in the northernmost locus (see Downum 1993, figure 3.5), which is approximately 300 m north of the current project area. The current project area is located on the eastern edge of the northern half of the site between the two northernmost loci. The density of artifacts and the presence of trash mounds and at least one roasting pit suggest that this area may actually connect the two loci. The density of surface features is similar to the defined loci's features and suggests that this portion of the Hog Farm site is representative of the overall site.

Historic-period features included 10 concrete foundations. Three of these consisted of multiple buildings, laid out in a row. Other features associated with the hog farm included a food can dump, a pressed brick dump and a concrete trough. Other trash features contained large metal barrels and or building construction rubble.

SIGNIFICANCE ASSESSMENT

National Register of Historic Places

The National Register of Historic Places (National Register) is the nation's inventory of historic sites. It was established after the passage of the National Historic Preservation Act of 1966 to promote preservation and study of historic resources. Most projects involving federal agencies, federal land, or federal funds require evaluation and mitigation of their impacts on properties eligible for the National Register. In addition, many state and local laws, ordinances, and regulations require similar evaluations.

In order for a property to be listed in the National Register, it must meet integrity requirements and at least one of four significance criteria. These criteria are summarized in Table 5. An important aspect of significance is a property's historic context (cultural affiliation and dates of use). If a historic context cannot be established, or if the property cannot be shown to be significant within its historic context, then it does not meet eligibility requirements for the National Register. Furthermore, except in special circumstances, properties must be at least 50 years old to be considered for inclusion in the National Register.

Table 5. National Register eligibility criteria (Code of Federal Regulations, Title 36, Part 60).

The quality of significance in American history, architecture, archeology, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:
A. That are associated with events that have made a significant contribution to the broad pattern of our history; or
B. That are associated with the lives of persons significant in our past; or
C. That embody the distinctive characteristics of a type, period, or method of construction or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
D. That have yielded, or may be likely to yield, information important in prehistory or history.

Assessment of AZ AA:11:12 (ASM)

The Hog Farm site is the largest site in the area. It is a large, prehistoric village that was occupied from the late Pioneer through the early Classic periods. The site has been interpreted as "perhaps the paramount village in a Preclassic settlement system" in the area (Downum 1993). This interpretation is based primarily on the site's large size—five discrete loci have been identified—and the presence of a Hohokam ballcourt (Downum 1993). The ballcourt, located in the far northeastern portion of the site, suggests a substantial pre-Classic occupation. The site's importance and the magnitude of occupation are postulated to have declined during the late Sedentary period, as the focus of occupation in the area shifted slightly to the north to the Los Robles Mound site, AA:11:25.

The site meets eligibility requirements for inclusion in the National Register under Criterion D, for the information it has yielded and is likely to yield about the pre-Classic and early Classic periods of the Hohokam sequence in Avra Valley. Ballcourt sites are not numerous in Avra Valley, and given this site's rural setting, it is in better condition than most other contemporary sites in the region.

PROJECT EFFECT

Tucson Water proposes to: (1) erect a new fence around the parcel, (2) conduct a survey using ground-penetrating radar, and (3) remove buried and surface trash. The fence construction will entail digging 1-ft-diameter holes that will be excavated to 5-ft-deep to accommodate 5-inch-diameter fence posts. The poles will be spaced 300 feet apart. The survey using ground-penetrating radar is designed to locate buried water lines, wells, and trash. If this technique is insufficient for determining the locations and depths of buried features, then a process called Induced Polarization (IP) will be used. Both of these survey procedures are surficial in nature and will not disturb buried archaeological features. The third proposed activity involves excavating with a backhoe to locate buried utilities, wells

and trash and to remove all trash. This activity has the potential to affect significant cultural resources.

RECOMMENDATIONS

The City of Tucson's Santa Cruz Farm property is located within the boundaries of an extensive archaeological site, AZ AA:11:12 (ASM), the Hog Farm site, that meets eligibility requirements of the National Register under Criterion D. The City's property contains substantial remains from the prehistoric village once present along Los Robles Wash as well as historic-period remnants of the hog farm that gave the site its name. The actions being proposed by the City will affect these cultural resources. In order to address these effects, Desert Archaeology recommends that a comprehensive treatment plan be developed that identifies appropriate measures to be taken prior to any ground disturbing activities. These measures may include further archival research on the historic-period hog farm component, monitoring of limited disturbances such as fence installation, and data recovery from both prehistoric and historic-period deposits in areas where more extensive ground disturbance will take place.

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*EFFECTIVE 12/20/94

APPENDIX A
PROTECTED GROUP OF PLANTS -- COVERED
LIST OF PROTECTED NATIVE PLANTS BY CATEGORIES

A. Highly Safeguarded Protected Native Plants

The following list includes those species of native plants and parts of plants, including the seeds and fruit, whose prospects for survival are in jeopardy or which are in danger of extinction.

1. **AGAVACEAE** Agave Family
   a. *Agave arizonica* Gentry & Weber--Arizona agave
   b. *Agave* delamateri Eckers & Hodgson ined.
   c. *Agave murpheyi* Gibson--Hohokam agave
   d. *Agave parviflora* Torr.--Santa Cruz striped agave, Small-flowered agave
   e. *Agave schottii* Engelm. var. *treleasei* (Toumey) Kearney & Peebles
2. **APIACEAE** Parsley Family. [= Umbelliferae]
   Lilaeopsis schaffneriana (Schlecht.) Coult. & Rose ssp. *recurva* (A. W. Hill) Affolter--Cienega false rush, Huachuca water umbel.
   Syn.: *Lilaeopsis recurva* A. W. Hill
3. **APOCYNACEAE** Dogbane Family
   a. *Amsonia kearneyana* Woods.--Kearney's bluestar
   b. *Cycladenia humilis* Benth. var. *jonesii* (Eastw.) Welsh & Atwood--Jone's cycladenia
4. **ASCLEPIADACEAE** Milkweed Family
   Asclepias welshii N. & P. Holmgren--Welsh's milkweed
5. **ASTERACEAE** Sunflower Family [= Compositae]
   a. *Erigeron lemmonii* Gray--Lemmon fleabane
   b. *Senecio franciscanus* Greene--San Francisco Peaks groundsel
   c. *Senecio huachucanus* Gray--Huachuca groundsel
6. **BURSERACEAE** Torch Wood Family
   Bursera fagaroides (H.B.K.) Engler--Fragrant bursera
7. **CACTACEAE** Cactus Family
   a. *Carnegiea gigantea* (Engelm.) Britt. & Rose--Saguaro: 'Crested' or 'Fan-top' form only
      Syn.: *Cereus giganteus* Engelm.
   b. *Coryphantha recurvata* (Engelm.) Britt. & Rose--Golden-chested beehive cactus
      Syn.: *Mammillaria recurvata* Engelm.
   c. *Coryphantha robbinsorum* (W. H. Earle) A. Zimmerman--Cochise pincushion cactus, Robbin's cory cactus.
      Syn.: *Cochiseia robbinsorum* W.H. Earle
   d. *Coryphantha scheeri* (Kuntze) L. Benson var. *robustispina* (Schott) L. Benson--Scheer's strong-spined cory cactus.
      Syn.: *Mammillaria robustispina* Schott
   e. *Echinocactus horizonthalonius* Lemaire var. *nicholii* L. Benson--Nichol's Turk's head cactus
   f. *Echinocereus triglochidiatus* Engelm. var. *arizonicus* (Rose ex Orcutt) L. Benson--Arizona hedgehog cactus
   g. *Echinomastus erectocentrus* (Coult.) Britt. & Rose var. *acunensis* (W.T.Marshall) L.Benson--Acuaa cactus
      Syn.: *Neolloydia erectocentra* (Coult.) L. Benson var. *acunensis* (W. T. Marshall) L. Benson
   h. *Pediocactus bradyi* L. Benson--Brady's pincushion cactus
   i. *Pediocactus paradinei* B. W. Benson--Paradine plains cactus

j. *Pediocactus peeblesianus* (Croizat) L. Benson var. *fickeiseniae* L. Benson
k. *Pediocactus peeblesianus* (Croizat) L. Benson var. *peeblesianus* Peebles' Navajo cactus, Navajo plains cactus
Syn.: *Navajoa peeblesiana* Croizat
l. *Pediocactus sileri* (Engelm.) L. Benson--Siler pincushion cactus
Syn.: *Utahia sileri* (Engelm.) Britt. & Rose

8. CYPERACEAE Sedge Family
Carex specuicola J. T. Howell--Navajo sedge

9. FABACEAE Pea Family [=Leguminosae]
a. *Astragalus cremnophylax* Barneby var. *cremnophylax* Sentry milk vetch
b. *Astragalus holmgreniorum* Barneby--Holmgren milk-vetch
c. *Dalea tentaculoides* Gentry--Gentry indigo bush

1. LENNOACEAE Lennoa Family
a. *Pholisma arenarium* Nutt.--Scaly-stemmed sand plant
b. *Pholisma sonorae* (Torr. ex Gray) Yatskievych--Sandfood, sandroot
Syn.: *Ammobroma sonorae* Torr. ex Gray

11. LILIACEAE Lily Family
Allium gooddingii Ownbey--Goodding's onion

12. ORCHIDACEAE Orchid Family
a. *Cypripedium calceolus* L. var. *pubescens* (Willd.) Correll--Yellow lady's slipper
b. *Hexalectris warnockii* Ames & Correll--Texas purple spike
c. *Spiranthes delitescens* C. Sheviak

13. POACEAE Grass Family [=Gramineae]
Puccinellia parishii A.S. Hitchc.--Parish alkali grass

14. POLYGONACEAE Buckwheat Family
Rumex orthoneurus Rech. f.

15. PSILOTACEAE Psilotum Family
Psilotum nudum (L.) Beauv. Bush Moss, Whisk Ferm

16. RANUNCULACEAE Buttercup Family
a. *Cimicifuga arizonica* Wats.--Arizona bugbane
b. *Clematis hirsutissima* Pursh var. *arizonica* (Heller) Erickson--Arizona leatherflower.

17. ROSACEAE Rose Family
Purshia subintegra (Kearney) J. Hendrickson--Arizona cliffrose, Burro Creek cliffrose
Syn.: *Cowania subintegra* Kearney

18. SALICACEAE Willow Family
Salix arizonica Dorn--Arizona willow

19. SCROPHULARIACEAE Figwort Family
Penstemon discolor Keck--Variegated beardtongue

B. Salvage Restricted Protected Native Plants

The following list includes those native plants which are not included in the highly safeguarded category but are subject to damage by theft or vandalism.

1. AGAVACEAE Agave Family
a. *Agave chrysantha* Peebles
b. *Agave deserti* Engelm. ssp. *simplex* Gentry--Desert agave
c. *Agave mckelveyana* Gentry
d. *Agave palmeri* Engelm.
e. *Agave parryi* Engelm. var. *couseii* (Engelm. ex Trel.) Kearney & Peebles
f. *Agave parryi* Engelm. var. *huachucensis* (Baker) Little ex L. Benson

Syn.: *Agave huachucensis* Baker

g. *Agave parryi* Engelm. var. *parryi*
h. *Agave toumeyana* Trel. ssp. *bella* (Breitung) Gentry
i. *Agave toumeyana* Trel. ssp. *toumeyana*
j. *Agave utahensis* Engelm. spp. *kaibabensis* (McKelvey) Gentry
Syn.: *Agave kaibabensis* McKelvey
k. *Agave utahensis* Engelm. var. *utahensis*
l. *Dasylirion wheeleri* Wats.--Sotol, desert spoon
m. *Nolina bigelovii* (Torr.)Wats.--Bigelow's nolina
n. *Nolina microcarpa* Wats.--Beargrass, sacahuista
o. *Nolina parryi* Wats.--Parry's nolina
p. *Nolina texana* Wats. var. *compacta* (Trel.) Johnst.--Bunchgrass
q. *Yucca angustissima* Engelm. var. *angustissima*
r. *Yucca angustissima* Engelm. var. *kanabensis* (McKelvey) Reveal
Syn.: *Yucca kanabensis* McKelvey
s. *Yucca arizonica* McKelvey
t. *Yucca baccata* Torr. var. *baccata*--Banana yucca
u. *Yucca baccata* Torr. var. *vespertina* McKelvey
v. *Yucca baileyi* Woot. & Standl. var. *intermedia* (McKelvey) Reveal
Syn.: *Yucca navajoa* Webber
w. *Yucca brevifolia* Engelm. var. *brevifolia*--Joshua tree
x. *Yucca brevifolia* Engelm. var. *jaegeriana* McKelvey
y. *Yucca elata* Engelm. var. *elata*--Soaptree yucca, palmilla
z. *Yucca elata* Engelm var. *utahensis* (McKelvey) Reveal
Syn.: *Yucca utahensis* McKelvey
aa. *Yucca elata* Engelm. var. *verdiensis* (McKelvey) Reveal
Syn.: *Yucca verdiensis* McKelvey
bb. *Yucca harrimaniae* Trel.
cc. *Yucca schidigera* Roezl.--Mohave yucca, Spanish dagger
dd. *Yucca schottii* Engelm.--Hairy yucca
ee. *Yucca thornberi* McKelvey
ff. *Yucca whipplei* Torr. var. *whipplei*--Our Lord's candle
Syn.: *Yucca newberryi* McKelvey

2. **AMARYLLIDACEAE** Amaryllis Family
Zephyranthes longifolia Hemsl.--Plains Rain Lily
3. **ANACARDIACEAE** Sumac Family
Rhus kearneyi Barkley--Kearney Sumac
4. **ARECACEAE** Palm Family [=Palmae]
Washingtonia filifera (Linden ex Andre) H. Wendl--California fan palm
5. **ASTERACEAE** Sunflower Family [=Compositae]
a. *Cirsium parryi* (Gray) Petrak ssp. *mogollonicum* Schaak
b. *Cirsium virginensis* Welsh--Virgin thistle
c. *Erigeron kuschei* Eastw.--Chiricahua fleabane
d. *Erigeron piscaticus* Nesom--Fish Creek fleabane
e. *Flaveria macdougalii* Theroux, Pinkava & Keil
f. *Perityle ajoensis* Todson--Ajo rock daisy
g. *Perityle cochisensis* (Niles) Powell--Chiricahua rock daisy
h. *Senecio quaerens* Greene--Gila groundsel
6. **BURSERACEAE** Torch-Wood Family
Bursera microphylla Gray--Elephant tree, torote

7. **CACTACEAE** Cactus Family

a. *Carnegiea gigantea* (Engelm.) Britt. & Rose--Saguaro
Syn.: *Cereus giganteus* Engelm.

b. *Coryphantha missouriensis* (Sweet) Britt. & Rose

c. *Coryphantha missouriensis* (Sweet) Britt. & Rose var. *marstonii* (Clover) L. Benson

d. *Coryphantha scheeri* (Kuntze) L. Benson var. *valida* (Engelm.) L. Benson

e. *Coryphantha strobiliformis* (Poselger) var. *orcuttii* (Rose) L. Benson

f. *Coryphantha strobiliformis* (Poselger) var. *strobiliformis*

g. *Coryphantha vivipara* (Nutt.) Britt. & Rose var. *alversonii* (Coult.) L. Benson

h. *Coryphantha vivipara* (Nutt.) Britt. & Rose var. *arizonica* (Engelm.) W. T. Marshall
Syn.: *Mammillaria arizonica* Engelm.

i. *Coryphantha vivipara* (Nutt.) Britt. & Rose var. *bisbeeana* (Orcutt) L. Benson

j. *Coryphantha vivipara* (Nutt.) Britt. & Rose var. *deserti* (Engelm.) W. T. Marshall
Syn.: *Mammillaria chlorantha* Engelm.

k. *Coryphantha vivipara* (Nutt.) Britt. & Rose var. *rosea* (Clokey) L. Benson

l. *Echinocactus polycephalus* Engelm. & Bigel. var. *polycephalus*

m. *Echinocactus polycephalus* Engelm. & Bigel. var. *xeranthemoides* Engelm. ex Coult.
Syn.: *Echinocactus xeranthemoides* Engelm. ex Coult.

n. *Echinocereus engelmannii* (Parry ex Engelm.) Lemaire var. *acicularis* L. Benson

o. *Echinocereus engelmannii* (Parry ex Engelm.) Lemaire var. *armatus* L. Benson

p. *Echinocereus engelmannii* (Parry ex Engelm.) Lemaire var. *chrysocentrus* L. Benson

q. *Echinocereus engelmannii* (Parry ex. Engelm.) Lemaire var. *engelmannii*

r. *Echinocereus engelmannii* (Parry) Lemaire var. *variegatus* (Engelm.) Engelm. ex Rümpler

s. *Echinocereus fasciculatus* (Engelm. ex B. D. Jackson) L. Benson var. fasciculatus
Syn.: *Echinocereus fendleri* (Engelm.) Rümpler var. *fasciculatus* (Engelm. ex B. D. Jackson) N. P. Taylor, *Echinocereus fendleri* (Engelm.) Rümpler var. *robusta* L. Benson; *Mammillaria fasciculata* Engelm.

t. *Echinocereus fasciculatus* (Engelm. ex B. D. Jackson) L. Benson var. *bonkerae* (Thornber & Bonker) L. Benson.
Syn.: *Echinocereus boyce-thompsonii* Orcutt var. *bonkerae* Peebles; *Echinocereus fendleri* (Engelm.) Rümpler var. *bonkerae* (Thornber & Bonker) L. Benson

u. *Echinocereus fasciculatus* (Engelm. ex B. D. Jackson) L. Benson var. *boyce-thompsonii* (Orcutt) L. Benson
Syn.: *Echinocereus boyce-thompsonii* Orcutt

v. *Echinocereus fendleri* (Engelm.) Rümpler var. *boyce-thompsonii* (Orcutt) L. Benson

w. *Echinocereus fendleri* (Engelm.) Rümpler var. *fendleri*

x. *Echinocereus fendleri* (Engelm.) Rümpler var. *rectispinus* (Peebles) L. Benson

y. *Echinocereus ledingii* Peebles

z. *Echinocereus nicholii* (L. Benson) Parfitt.
Syn.: *Echinocereus engelmannii* (Parry ex Engelm.) Lemaire var. *nicholii* L. Benson

aa. *Echinocereus pectinatus* (Scheidw.) Engelm. var. *dasyacanthus* (Engelm.) N. P. Taylor
Syn.: *Echinocereus pectinatus* (Scheidw.) Engelm. var. *neomexicanus* (Coult.) L. Benson

bb. *Echinocereus polyacanthus* Engelm. (1848) var. *polyacanthus*

cc. *Echinocereus pseudopectinatus* (N. P. Taylor) N. P. Taylor
Syn.: *Echinocereus bristolii* W. T. Marshall var. *pseudopectinatus* N. P. Taylor, *Echinocereus pectinatus* (Scheidw.) Engelm. var. *pectinatus sensu* Kearney and Peebles, Arizona Flora, and L. Benson, The Cacti of Arizona and The Cacti of the United States and Canada.

dd. *Echinocereus rigidissimus* (Engelm.) Hort. F. A. Haage.
Syn.: *Echinocereus pectinatus* (Scheidw.) Engelm. var. *rigidissimus* (Engelm.) Engelm.

ex Rümpler--Rainbow cactus

ee. *Echinocereus triglochidiatus* Engelm. var. *gonacanthus* (Engelm. & Bigel.) Boiss.

ff. *Echinocereus triglochidiatus* Engelm. var. *melanacanthus* (Engelm.) L. Benson
Syn.: *Mammillaria aggregata* Engelm.

gg. *Echinocereus triglochidiatus* Engelm. var. *mojavensis* (Engelm.) L. Benson

hh. *Echinocereus triglochidiatus* Engelm. var. *neomexicanus* (Standl.) Standl. ex W. T. Marshall.
Syn.: *Echinocereus triglochidiatus* Engelm. var. *polyacanthus* (Engelm. 1859 non 1848) L. Benson

ii. *Echinocereus triglochidiatus* Engelm. var. *triglochidiatus*

jj. *Echinomastus erectocentrus* (Coult.) Britt. & Rose var. *erectocentrus*
Syn.: *Neolloydia erectocentra* (Coult.) L. Benson var. *erectocentra*

kk. *Echinomastus intertextus* (Engelm.) Britt. & Rose
Syn.: *Neolloydia intertexta* (Engelg.) L. Benson

ll. *Echinomastus johnsonii* (Parry) Baxter--Beehive cactus
Syn.: *Neolloydia johnsonii* (Parry) L. Benson

mm. *Epithelantha micromeris* (Engelm.) Weber ex Britt. & Rose

nn. *Ferocactus cylindraceus* (Engelm.) Orcutt var. *cylindraceus*--Barrel cactus
Syn.: *Ferocactus acanthodes* (Lemaire) Britt. & Rose var. *acanthodes*

oo. *Ferocactus cylindraceus* (Engelm.) Orcutt var. *eastwoodiae* (Engelm.) N. P. Taylor
Syn.: *Ferocactus acanthodes* (Lemaire) Britt. & Rose var. *eastwoodiae* L. Benson; Ferocactus eastwoodiae (L. Benson) L. Benson

pp. *Ferocactus cylindraceus* (Engelm.) Orcutt. var. *lecontei* (Engelm.) H. Bravo
Syn.: *Ferocactus acanthodes* (Lemaire) Britt. & Rose var. *leconti* (Engelm.) Lindsay; *Ferocactus lecontei* (Engelm.) Britt. & Rose

qq. *Ferocactus emoryi* (Engelm.) Orcutt--Barrel cactus
Syn.: *Ferocactus covillei* Britt. & Rose

rr. *Ferocactus wislizenii* (Engelm.) Britt. & Rose--Barrel cactus

ss. *Lophocereus schottii* (Engelm.) Britt. & Rose--Senita

tt. *Mammillaria grahamii* Engelm. var. *grahamii*

uu. *Mammillaria grahamii* Engelm. var. *oliviae* (Orcutt) L. Benson
Syn.: *Mammillaria oliviae* Orcutt

vv. *Mammillaria heyderi* Mühlenpf. var. *heyderi*
Syn.: *Mammillaria gummifera* Engelm. var. *applanata* (Engelm.) L. Benson

ww. *Mammillaria heyderi* Mühlenpf. var. *macdougalii* (Rose) L. Benson
Syn.: *Mammillaria gummifera* Engelm. var. *macdougalii* (Rose) L. Benson; *Mammillaria macdougalii* Rose

xx. *Mammillaria heyderi* Mühlenpf. var. *meiacantha* (Engelm.) L. Benson
Syn.: *Mammillaria gummifera* Engelm. var. *meiacantha* (Engelm.) L. Benson

yy. *Mammillaria lasiacantha* Engelm.

zz. *Mammillaria mainiae* K. Brand.

aaa. *Mammillaria microcarpa* Engelm.

bbb. *Mammillaria tetrancistra* Engelm.

ccc. *Mammillaria thornberi* Orcutt

ddd. *Mammillaria viridiflora* (Britt. & Rose) Bödeker.
Syn.: *Mammillaria orestra* L. Benson

eee. *Mammillaria wrightii* Engelm. var. *wilcoxii* (Toumey ex K. Schumann) W. T. Marshall
Syn.: *Mammillaria wilcoxii* Toumey

fff. *Mammillaria wrightii* Engelm. var. *wrightii*

ggg. *Opuntia acanthocarpa* Engelm. & Bigel. var. *acanthocarpa*--Buckhorn cholla

hhh. *Opuntia acanthocarpa* Engelm. & Bigel. var. *coloradensis* L. Benson

iii. *Opuntia acanthocarpa* Engelm. & Bigel. var. *major* L. Benson
Syn.: *Opuntia acanthocarpa* Engelm. & Bigel var. *ramosa* Peebles

jjj. *Opuntia acanthocarpa* Engelm. & Bigel. var. *thornberi* (Thornber & Bonker) L. Benson
Syn.: *Opuntia thornberi* Thornber & Bonker

kkk. *Opuntia arbuscula* Engelm.--Pencil cholla

lll. *Opuntia basilaris* Engelm. & Bigel. var. *aurea* (Baxter) W. T. Marshall--Yellow beavertail
Syn.: *Opuntia aurea* Baxter

mmm. *Opuntia basilaris* Engelm. & Bigel. var. *basilaris*--Beavertail cactus

nnn. *Opuntia basilaris* Engelm. & Bigel. var. *longiareolata* (Clover & Jotter) L. Benson

ooo. *Opuntia basilaris* Engelm. & Bigel. var. *treleasei* (Coult.) Toumey

ppp. *Opuntia bigelovii* Engelm.--Teddy-bear cholla

qqq. *Opuntia canada* Griffiths (*O. phaeacantha* Engelm. var. *laevis X major* and *O. gilvescens* Griffiths).

rrr. *Opuntia chlorotica* Engelm. & Bigel.--Pancake prickly-pear

sss. *Opuntia clavata* Engelm.--Club cholla

ttt. *Opuntia curvospina* Griffiths

uuu. *Opuntia echinocarpa* Engelm. & Bigel--Silver cholla

vvv. *Opuntia emoryi* Engelm.--Devil cholla
Syn.: *Opuntia stanlyi* Engelm. ex B. D. Jackson var. *stanlyi*

www. *Opuntia engelmannii* Salm-Dyck ex Engelm. var. *engelmannii*--Engelmann's prickly-pear
Syn.: *Opuntia phaeacantha* Engelm. var. *discata* (Griffiths) Benson & Walkington

xxx. *Opuntia engelmannii* Salm-Dyck ex Engelm. var. *flavospina* (L.Benson) Parfitt & Pinkava
Syn.: *Opuntia phaeacantha* Engelm. var. *flavispina* L. Benson

yyy. *Opuntia erinacea* Engelm. & Bigel. var. *erinacea*--Mohave prickly-pear

zzz. *Opuntia erinacea* Engelm. & Bigel. var. *hystricina* (Engelm. & Bigel.) L. Benson
Syn.: *Opuntia hystricina* Engelm. & Bigel.

aaaa. *Opuntia erinacea* Engelm. & Bigel. var. *ursina* (Weber) Parish--Grizzly bear prickly-pear
Syn.: *Opuntia ursina* Weber

bbbb. *Opuntia erinacea* Engelm. & Bigel. var. *utahensis* (Engelm.) L. Benson
Syn.: *Opuntia rhodantha* Schum.

cccc. *Opuntia fragilis* Nutt. var. *brachyarthra* (Engelm. & Bigel.) Coult.

dddd. *Opuntia fragilis* Nutt. var. *fragilis*--Little prickly-pear

eeee. *Opuntia fulgida* Engelm. var. *fulgida*--Jumping chain-fruit cholla

ffff. *Opuntia fulgida* Engelm. var. *mammillata* (Schott) Coult.

gggg. *Opuntia imbricata* (Haw.) DC.--Tree cholla

hhhh. *Opuntia X kelvinensis* V. & K. Grant pro sp.
Syn.: *Opuntia kelvinensis* V. & K. Grant

iiii. *Opuntia kleiniae* DC. var. *tetracantha* (Toumey) W. T. Marshall
Syn.: *Opuntia tetrancistra* Toumey

jjjj. *Opuntia kunzei* Rose.
Syn.: *Opuntia stanlyi* Engelm. ex B. D. Jackson var. *kunzei* (Rose) L. Benson; *Opuntia kunzei* Rose var. *wrightiana* (E. M. Baxter) Peebles; *Opuntia wrightiana* E. M. Baxter

kkkk. *Opuntia leptocaulis* DC.--Desert Christmas cactus, Pencil cholla

llll. *Opuntia littoralis* (Engelm.) Cockl. var. *vaseyi* (Coult.) Benson & Walkington

mmmm. *Opuntia macrocentra* Engelm.--Purple prickly-pear
Syn.: *Opuntia violacea* Engelm. ex B. D. Jackson var. *macrocentra* (Engelm.) L. Benson; *Opuntia violacea* Engelm. ex B. D. Jackson var. *violacea*

nnnn. *Opuntia macrorhiza* Engelm. var. *macrorhiza*--Plains prickly-pear
Syn.: *Opuntia plumbea* Rose

oooo. *Opuntia macrorhiza* Engelm. var. *pottsii* (Salm-Dyck) L. Benson

pppp. *Opuntia martiniana* (L. Benson) Parfitt
Syn.: *Opuntia littoralis* (Engelm.) Cockerell var. *martiniana* (L. Benson) L. Benson; *Opuntia macrocentra* Engelm. var. *martiniana L. Benson*

qqqq. *Opuntia nicholii* L. Benson--Navajo Bridge prickly-pear

rrrr. *Opuntia parishii* Orcutt.
Syn.: *Opuntia stanlyi* Engelm. ex B. D. Jackson var. *parishii* (Orcutt) L. Benson

ssss. *Opuntia phaeacantha* Engelm. var. *laevis* (Coult.) L. Benson
Syn.: *Opuntia laevis* Coult.

tttt. *Opuntia phaeacantha* Engelm. var. *major* Engelm.

uuuu. *Opuntia phaeacantha* Engelm. var. *phaeacantha*

vvvv. *Opuntia phaeacantha* Engelm. var. *superbospina* (Griffiths) L. Benson

wwww. *Opuntia polyacantha* Haw. var. *juniperina* (Engelm.) L. Benson

xxxx. *Opuntia polyacantha* Haw. var. *rufispina* (Engelm.) L. Benson

yyyy. *Opuntia polyacantha* Haw. var. *trichophora* (Engelm. & Bigel.) L. Benson

zzzz. *Opuntia pulchella* Engelm.--Sand cholla

aaaaa. *Opuntia ramosissima* Engelm.--Diamond cholla

bbbbb. *Opuntia santa-rita* (Griffiths & Hare) Rose--Santa Rita prickly-pear
Syn.: *Opuntia violacea* Engelm. ex B. D. Jackson var. *santa-rita* (Griffiths & Hare) L. Benson

ccccc. *Opuntia spinosior* (Engelm.) Toumey--Cane cholla

ddddd. *Opuntia versicolor* Engelm.--Staghorn cholla

eeeee. *Opuntia whipplei* Engelm. & Bigel. var. *multigeniculata* (Clokey) L. Benson

fffff. *Opuntia whipplei* Engelm. & Bigel. var. *whipplei*--Whipple cholla

ggggg. *Opuntia wigginsii* L. Benson

hhhhh. *Pediocactus papyracanthus* (Engelm.) L. Benson Grama grass cactus
Syn.: *Toumeya papyracanthus* (Engelm.) Britt. & Rose

iiiii. *Pediocactus simpsonii* (Engelm.) Britt & Rose var. *simpsonii*

jjjjj. *Peniocereus greggii* (Engelm.) Britt. & Rose var. *greggii*--Night-blooming cereus
Syn.: *Cereus greggii* Engelm.

kkkkk. *Peniocereus greggii* (Engelm.) Britt & Rose var. *transmontanus*--Queen-of-the-Night

lllll. *Peniocereus striatus* (Brandegee) Buxbaum.
Syn.: *Neoevansia striata* (Brandegee) Sanchez-Mejorada; *Cereus striatus* Brandegee; *Wilcoxia diguetii* (Webber) Peebles

mmmmm. *Sclerocactus parviflorus* Clover & Jotter var. *intermedius* (Peebles) Woodruff & L. Benson
Syn.: *Sclerocactus intermedius* Peebles

nnnnn. *Sclerocactus parviflorus* Clover & Jotter var. *parviflorus*
Syn.: *Sclerocactus whipplei* (Engelm. & Bigel.) Britt. & Rose var. *roseus* (Clover) L. Benson

ooooo. *Sclerocactus pubispinus* (Engelm.) L. Peebles

ppppp. *Sclerocactus spinosior* (Engelm.) Woodruff & L. Benson
Syn.: *Sclerocactus pubispinus* (Engelm.) L. Benson var. *sileri* L. Benson

qqqqq. *Sclerocactus whipplei* (Engelm. & Bigel.) Britt. & Rose

rrrrr. *Stenocereus thurberi* (Engelm.) F. Buxbaum--Organ pipe cactus
Syn.: *Cereus thurberi* Engelm.; *Lemairocereus thurberi* (Engelm.) Britt. & Rose

8. **CAMPANULACEAE** Bellflower Family
   a. *Lobelia cardinalis* L. ssp. *graminea* (Lam.) McVaugh--Cardinal flower
   b. *Lobelia fenestralis* Cav.--Leafy lobelia
   c. *Lobelia laxiflora* H. B. K. var. *angustifolia* A. DC.

9. CAPPARACEAE Cappar Family [=Capparidaceae]
   Cleome multicaulis DC.--Playa spiderflower
1. COCHLOSPERMACEAE Cochlospermum Family
   Amoreuxia gonzalezii Sprague & Riley
11. CHENOPODIACEAE Goosefoot Family
   Atriplex hymenelytra (Torr.) Wats.
12. CRASSULACEAE Stonecrop Family
   a. *Dudleya arizonica* (Nutt.) Britt. & Rose
      Syn.: *Echeveria pulverulenta* Nutt. ssp. *arizonica* (Rose) Clokey
   b. *Dudleya saxosa* (M.E. Jones) Britt. & Rose ssp. *collomiae* (Rose) Moran
      Syn.: *Echeveria collomiae* (Rose) Kearney & Peebles
   c. *Graptopetalum bartramii* Rose
      Syn.: *Echevaria bartramii* (Rose) K. & P.
   d. *Graptopetalum bartramii* Rose--Bartram's stonecrop, Bartram's live-forever
      Syn.: *Echeveria bartramii* (Rose) Kearney & Peebles
   e. *Graptopetalum rusbyi* (Greene) Rose
      Syn.: *Echeveria rusbyi* (Greene) Nels. & Macbr.
   f. *Sedum cockerellii* Britt.
   g. *Sedum griffithsii* Rose
   h. *Sedum lanceolatum* Torr.
      Syn.: *Sedum stenopetalum* Pursh
   i. *Sedum rhodanthum* Gray
   j. *Sedum stelliforme* Wats.
13. CROSSOSOMATACEAE Crossosoma Family
   Apacheria chiricahuensis C. T. Mason--Chiricahua rock flower
14. CUCURBITACEAE Gourd Family
   Tumamoca macdougalii Rose--Tumamoc globeberry
15. EUPHORBIACEAE Spurge Family
   a. *Euphorbia plummerae* Wats.--Woodland spurge
   b. *Sapium biloculare* (Wats.) Pax--Mexican jumping-bean
16. FABACEAE Pea Family [=Leguminosae]
   a. *Astragalus corbrensis* Gray var. *maguirei* Kearney
   b. *Astragalus cremnophylax* Barneby var. *myriorraphis* Barneby--Cliff milk-vetch
   c. *Astragalus hypoxylus* Wats.--Huachuca milk-vetch
   d. *Astragalus nutriosensis* Sanderson--Nutrioso milk-vetch
   e. *Astragalus xiphoides* (Barneby) Barneby--Gladiator milk-vetch
   f. *Cercis occidentalis* Torr.--California redbud
   g. *Errazurizia rotundata* (Woot.) Barneby
      Syn.: *Parryella rotundata* Woot.
   h. *Lysiloma microphylla* Benth. var. *thornberi* (Britt. & Rose) Isely--Feather bush
      Syn.: *Lysiloma thornberi* Britt. & Rose
   i. *Parkinsonia aculeata* L.--Jerusalem Thorn
   j. *Phaseolus supinus* Wiggins & Rollins
17. FOUQUIERIACEAE Ocotillo Family
   Fouquieria splendens Engelm.--Ocotillo, coach-whip, monkey-tail
18. GENTIANACEAE Gentian Family
   Gentianella wislizenii (Engelm.) J. Gillett
   Syn.: *Gentiana wislizenii* Engelm.
19. LAMIACEAE Mint Family
   a. *Hedeoma diffusum* Green--Flagstaff pennyroyal

b. *Salvia dorrii* ssp. *mearnsii*
c. *Trichostema micranthum* Gray

2. **LILIACEAE** Lily Family
a. *Allium acuminatum* Hook.
b. *Allium bigelovii* Wats.
c. *Allium biseptrum* Wats. var. *palmeri* (Wats.) Cronq.
Syn.: *Allium palmeri* Wats.
d. *Allium cernuum* Roth. var. *neomexicanum* (Rydb.) Macbr.--Nodding onion
e. *Allium cernuum* Roth. var. *obtusum* Ckll.
f. *Allium geyeri* Wats. var. *geyeri*
g. *Allium geyeri* Wats. var. *tenerum* Jones
h. *Allium kunthii* Don
i. *Allium macropetalum* Rydb.
j. *Allium nevadense* Wats. var. *cristatum* (Wats.) Ownbey
k. *Allium nevadense* Wats. var. *nevadense*
l. *Allium parishii* Wats.
m. *Allium plummerae* Wats.
n. *Allium rhizomatum* Woot. & Standl. Incl.: *Allium glandulosum* Link & Otto *sensu* Kearney & Peebles
o. *Androstephium breviflorum* Wats.--Funnel-lily
p. *Calochortus ambiguus* (Jones) Ownbey
q. *Calochortus aureus* Wats.
Syn.: *Calochortus nuttallii* Torr. & Gray var. *aureus* (Wats.) Ownbey
r. *Calochortus flexuosus* Wats.--Straggling mariposa
s. *Calochortus gunnisonii* Wats.
t. *Calochortus kennedyi* Porter var. *kennedyi*--Desert mariposa
u. *Calochortus kennedyi* Porter var. *munzii* Jeps.
v. *Dichelostemma pulchellum* (Salisbi) Heller var. *pauciflorum* (Torr.) Hoover
w. *Disporum trachycarpum* (Wats.) Benth. & Hook. var. *subglabrum* Kelso
x. *Disporum trachycarpum* (Wats.) Benth. & Hook. var. *trachycarpum*
y. *Echeandia flavescens* (Schultes & Schultes) Cruden
Syn.: *Anthericum torreyi* Baker
z. *Eremocrinum albomarginatum* Jones
aa. *Fritillaria atropurpurea* Nutt.
bb. *Hesperocallis undulata* Gray--Ajo lily
cc. *Lilium parryi* Wats.--Lemon lily
dd. *Lilium umbellatum* Pursh
ee. *Maianthemum racemosum* (L.) Link. ssp. *amplexicaule* (Nutt.) LaFrankie
Syn.: *Smilacina racemosa* (L.) Desf. var. *amplexicaulis* (Nutt.) Wats.
ff. *Maianthemum racemosum* (L.) Link ssp. *racemosum*--False Solomon's seal
Syn.: *Smilacina racemosa* (L.) Desf. var. *racemosa*; *Smilacina racemosa* (L.) Desf. var. *cylindrata* Fern.
gg. *Maianthemum stellatum* (L.) Link
Syn.: *Smilacina stellata* (L.) Desf.--Starflower
hh. *Milla biflora* Cav.--Mexican star
ii. *Nothoscordum texanum* Jones
jj. *Polygonatum cobrense* (Woot. & Standl.) Gates
kk. *Streptopus amplexifolius* (L.) DC.--Twisted stalk
ll. *Triteleia lemmonae* (Wats.) Greene
mm. *Triteleiopsis palmeri* (Wats.) Hoover

nn. *Veratrum californicum* Durand.--False hellebore
oo. *Zephyranthes longifolia* Hemsl.--Plains rain lily
pp. *Zigadenus elegans* Pursh--White camas, alkali-grass
qq. *Zigadenus paniculatus* (Nutt.) Wats.--Sand-corn
rr. *Zigadenus virescens* (H. B. K.) Macbr.

21. **MALVACEAE** Mallow Family
a. *Abutilon parishii* Wats.--Tucson Indian mallow
b. *Abutilon thurberi* Gray--Baboquivari Indian mallow

22. **ONAGRACEAE** Evening Primrose Family
Camissonia exilis (Raven) Raven

23. **ORCHIDACEAE** Orchid Family
a. *Calypso bulbosa* (L.) Oakes var. *americana* (R. Br.) Luer
b. *Coeloglossum viride* (L.) Hartmann var. *virescens* (Muhl.) Luer
Syn.: *Habenaria viridis* (L.) R. Br. var. *bracteata* (Muhl.) Gray
c. *Corallorhiza maculata* Raf.--Spotted coral root
d. *Corallorhiza striata* Lindl.--Striped coral root
e. *Corallorhiza wisteriana* Conrad--Spring coral root
f. *Epipactis gigantea* Douglas ex Hook.--Giant helleborine
g. *Goodyera oblongifolia* Raf.
h. *Goodyera repens* (L.) R. Br.
i. *Hexalectris spicata* (Walt.) Barnhart--Crested coral root
j. *Listera convallarioides* (Swartz) Nutt.--Broad-leaved twayblade
k. *Malaxis corymbosa* (S. Wats.) Kuntze
l. *Malaxis ehrenbergii* (Reichb. f.) Kuntze
m. *Malaxis macrostachya* (Lexarza) Kuntze--Mountain malaxia
Syn.: *Malaxis soulei* L. O. Williams
n. *Malaxis tenuis* (S. Wats.) Ames
o. *Platanthera hyperborea* (L.) Lindley var. *gracilis* (Lindley) Luer
Syn.: *Habenaria sparsiflora* Wats. var. *laxiflora* (Rydb.) Correll
p. *Platanthera hyperborea* (L.) Lindley var. *hyperborea*--Northern green orchid
Syn.: *Habenaria hyperborea* (L.) R. Br.
q. *Platanthera limosa* Lindl.--Thurber's bog orchid
Syn.: *Habenaria limosa* (Lindley) Hemsley
r. *Platanthera sparsiflora* (Wats.) Schlechter var. *ensifolia* (Rydb.) Luer
s. *Platanthera sparsiflora* (Wats.) var. *laxiflora* (Rydb.) Correll
t. *Platanthera sparsiflora* (Wats.) Schlechter var. *sparsiflora*--Sparsely-flowered bog orchid
Syn.: *Habenaria sparsiflora* Wats.
u. *Platanthera stricta* Lindl.--Slender bog orchid
Syn.: *Habenaria saccata* Greene; *Platanthera saccata* (Greene) Hulten
v. *Platanthera viridis* (L.) R. Br. var. *bracteata* (Muhl.) Gray--Long-bracted habenaria
w. *Spiranthes michaucana* (La Llave & Lex.) Hemsl.
x. *Spiranthes parasitica* A. Rich. & Gal.
y. *Spiranthes romanzoffiana* Cham.--Hooded ladies tresses

24. **PAPAVERACEAE** Poppy Family
Arctomecon californica Torr. & Frém.--Golden-bear poppy, Yellow-flowered desert poppy

25. **PINACEAE** Pine Family
Pinus aristata Engelm.--Bristlecone pine

26. **POLYGONACEAE** Buckwheat Family
a. *Eriogonum apachense* Reveal

b. *Eriogonum capillare* Small
c. *Eriogonum mortonianum* Reveal--Morton's buckwheat
d. *Eriogonum ripleyi* J. T. Howell--Ripley's wild buckwheat, Frazier's Well buckwheat
e. *Eriogonum thompsonae* Wats. var. *atwoodii* Reveal--Atwood's buckwheat

27. PORTULACEAE Purslane Family
a. *Talinum humile* Greene--Pinos Altos flame flower
b. *Talinum marginatum* Greene
c. *Talinum validulum* Greene--Tusayan flame flower

28. PRIMULACEAE Primrose Family
a. *Dodecatheon alpinum* (Gray) Greene ssp. *majus* H. J. Thompson
b. *Dodecatheon dentatum* Hook. ssp. *ellisiae* (Standl.) H. J. Thompson
c. *Dodecatheon pulchellum* (Raf.) Merrill
d. *Primula hunnewellii* Fern.
e. *Primula rusbyi* Greene
f. *Primula specuicola* Rydb.

29. RANUNCULACEAE Buttercup Family
a. *Aquilegia caerulea* James ssp. *pinetorum* (Tidest.) Payson--Rocky Mountain Columbine
b. *Aquilegia chrysantha* Gray
c. *Aquilegia desertorum* (Jones) Ckll.--Desert columbine, Mogollon columbine
d. *Aquilegia elegantula* Greene
e. *Aquilegia longissima* Gray--Long Spur Columbine
f. *Aquilegia micrantha* Eastw.
g. *Aquilegia triternata* Payson

3. ROSACEAE Rose Family
a. *Rosa stellata* Woot.--ssp. *abyssa* A. Phillips Grand Canyon rose
b. *Vauquelinia californica* (Torr.) Sarg. ssp. *pauciflora* (Standl.) Hess & Henrickson--Few-flowered Arizona rosewood

31. SCROPHULARIACEAE Figwort Family
a. *Castilleja mogollonica* Pennell
b. *Penstemon albomarginatus* Jones
c. *Penstemon bicolor* (Brandeg.) Clokey & Keck ssp. *roseus* Clokey & Keck
d. *Penstemon clutei* A. Nels.
e. *Penstemon distans* N. Holmgren--Mt. Trumbull beardtongue

32. SIMAROUBACEAE Simarouba Family
Castela emoryi (Gray) Moran & Felger--Crucifixion thorn
Syn.: *Holacantha emoryi* Gray

33. STERCULIACEAE Cacao Family
Fremontodendron californicum (Torr.) Coville--Flannel bush

C. Export Restricted Protected Native Plants

The following list includes those protected native plants which are not included in the highly safeguarded category but are subject to overdepletion if their exportation from this state is permitted.

D. Salvage Assessed Protected Native Plants

The following list includes those native plants which are not included in either the highly safeguarded or salvage restricted categories but have a sufficient value if salvaged.

1. BIGNONIACEAE Bignonia Family

a. *Chilopsis linearis* (Cav.) Sweet var. *arcuata* Fosberg--Desert-willow
b. *Chilopsis linearis* (Cav.) Sweet var. *glutinosa* (Engelm.) Fosberg

2. **FABACEAE** Pea Family [=Leguminosae]
   a. *Cercidium floridum* Benth.--Blue palo verde
   b. *Cercidium microphyllum* (Torr.) Rose & Johnst.--Foothill palo verde
   c. *Olneya tesota* Gray--Desert ironwood
   d. *Prosopis glandulosa* Torr. var. *glandulosa*--Honey mesquite
      Syn.: *Prosopis juliflora* (Swartz) DC. var. *glandulosa* (Torr.) Ckll.
   e. *Prosopis glandulosa* Torr. var. *torreyana* (Benson) M. C. Johnst.--Western honey mesquite
      Syn.: *Prosopis juliflora* (Swartz) DC. var. *torreyana* Benson
   f. *Prosopis pubescens* Benth.--Screwbean mesquite
   g. *Prosopis velutina* Woot.--Velvet mesquite
      Syn.: *Prosopis juliflora* (Swartz) DC. var. *velutina* (Woot.) Sarg.
   h. *Psorothamnus spinosus* (Gray) Barneby--Smoke tree.
      Syn.: *Dalea spinosa* Gray

E. Harvest Restricted Protected Native Plants

The following list includes those native plants which are not included in the highly safeguarded category but are subject to excessive harvesting or overcutting because of their intrinsic value.

1. **AGAVACEAE** Agave Family
   a. *Nolina bigelovii* (Torr.) Wats.--Bigelow's nolina
   b. *Nolina microcarpa* Wats.--Beargrass, sacahuista
   c. *Nolina parryi* Wats.--Parry's nolina
   d. *Nolina texana* Wats. var. *compacta* (Trel.) Johnst.--Bunchgrass
   e. *Yucca baccata* Torr. var. *baccata*--Banana yucca
   f. *Yucca schidigera* Roezl.--Mohave yucca, Spanish dagger

2. **FABACEAE** Pea Family [=Leguminosae]
   a. *Olneya tesota* Gray--Desert ironwood
   b. *Prosopis glandulosa* Torr. var. *glandulosa*--Honey mesquite
      Syn.: *Prosopis juliflora* (Swartz) DC. var. *glandulosa* (Torr.) Ckll.
   c. *Prosopis glandulosa* Torr. var. *torreyana* (Benson) M. C. Johnst.--Western honey mesquite Syn.: *Prosopis juliflora* (Swartz) DC. var. *torreyana* Benson
   d. *Prosopis pubescens* Benth.--Screwbean mesquite
   e. *Prosopis velutina* Woot.--Velvet mesquite
      Syn.: *Prosopis juliflora* (Swartz) DC. var. *velutina* (Woot.) Sarg.

EFFECTIVE December 20, 1994

FYI: CHRIS LOPEZ

MEMORANDUM

DATE: June 16, 2000

TO: Harold Maxwell
Water Operations
Superintendent

FROM: Dan Sweet
Operations Project
Coordinator

SUBJECT: Avra Valley Land: Management of Weeds and Vegetation

At your request I have reviewed the **Avra Valley Land Use Study for City of Tucson Property Holdings** (AVLUS) as approved by Mayor and Council on March 4, 1996 for findings and recommendations related to weeds and vegetation management on Tucson Water Avra Valley farm lands.

Here are summary conclusions from that review:

1. The City of Tucson owns almost 23,000 acres or 36 square miles of retired farmland in Avra Valley. This land, purchased from 1971 through 1986 with water revenues for water rights, includes 32 separate parcels distributed within a 350 square mile area.
2. Abandoned or retired farmland is subject to multiple problems, including dust, erosion, and noxious weed growth.
3. The City of Tucson approximately 25 years ago established a policy of Avra Valley land maintenance.
4. A major element of the City's policy is to control dust, erosion, and noxious weed growth by establishing naturally sustained, beneficial vegetation.
5. The accepted means of establishing beneficial vegetation are:
   - Noxious weed cutting
   - Selective burning of noxious weed growth areas
   - Reseeding of native plant species
   - Installation of fencing and barriers to prevent trespass damaging to land and vegetation
   - Flood control and/or grading to prevent erosion and allow revegetation
6. Tucson Water, the agent of the City's Avra Valley land maintenance policy, "has accomplished a great deal in restoring and managing the Avra Valley properties with [the] minimal staff and funding" which have been allocated for that purpose.

7. Over 50% of the Avra Valley properties (at the time of the AVLUS adoption) are now in excellent or good condition.
8. Some properties, including the Simpson and Santa Cruz farms, are in poor to fair condition. These properties will require more intensive management investment for weed control and revegetation.
9. ". . . it is recommended that the City continue to address property restoration . . ."
10. Additional resources should be located ". . . to restore vegetation and enhance habitat, creating an opportunity for the City to demonstrate environmental leadership."

Following are direct quotations from the AVLUS, related to weed control and vegetation. Numbers in parentheses following text selections are the AVLUS page numbers where the quotations may be found.

Background/Policy Development

"When initial land purchases were made in 1971, the City generally ignored the need for maintenance of the retired farms. This policy led to problems such as uncontrolled weed growth, dust, erosion, vandalism, and trespassing. Because of these problems, some of the remaining farmers filed lawsuits against the City and were generally successful in their claims. As the expense of paying claims and other costs mounted the Manager's Office determined that a systematic land maintenance program was necessary. . . . This included . . . the costs of revegetation efforts . . ." (6)

"As the land management program was implemented, the City addressed the important problems associated with the transition from plowed and irrigated fields to a stable vegetated state that required little or no irrigation. A program was initiated to grow cereal grains instead of cotton as the last irrigated crop. Cotton, as the last irrigated crop, leaves fields barren due to growing practices. Such fields are immediately subject to erosion and establishment of tumbleweed infestation. Fields with grain as the last crop reduce erosion problems and support the re-establishment of native plant and animal species. The farms subject to this grain planting program are, in most cases, in much better condition than those that were not. " (6)

DATE: June 16, 2000
TO: Harold Maxwell **FROM:** Dan Sweet
SUBJECT: Avra Valley Land: Management of Weeds and Vegetation

Management to Date
"The City's management emphasis to date has been primarily directed toward maintenance, particularly weed control. Weed control and revegetation is necessary due to the disturbed nature of retired farmland." (i)

"In order to manage weeds, dust, and erosion the [City] began a program of weed control through selective burning and reseeding the area with native vegetation. Imprinting the soil was tested to retain rain water where seeds were planted. Other management procedures included the installation of fences and signage . . . Today, vegetation has been established on many parcels, in some cases very successfully." (7)

"The [regular] cutting of weeds is required on several parcels to eliminate fire hazard and minimize problems with 'noxious weeds.' " (8)

"According to maintenance staff, approximately one-half of the City-owned property is stabilized and is relatively weed-free. The maintenance crew typically cuts weeds on the other half of the City-owned property two times a year." (8)

"Tucson Water has accomplished a great deal in restoring and managing the Avra valley properties with minimal staff and funding. However, it is recommended that the City continue to address property restoration needs and upgrade management procedures." (iii)

Classification of Properties
"In order to assess progress toward restoration of the City-owned Avra Valley parcels . . . 'general vegetative condition' categories were determined based on various characteristics of the properties . . .
Class I and II Wildlife Habitat and Wildlife Movement Corridors - areas mapped on the Critical and Sensitive Wildlife Habitat Map by Dr. William Shaw and found to be in good/excellent condition. These are prime areas which support native vegetation and wildlife.
Excellent Condition – areas which require little or no maintenance or flood control or were not disturbed by past uses.
Good Condition – areas which may need minor maintenance or flood control improvements. Parcels in good condition typically have a adequate cover of native and/or non-native vegetation.

Fair Condition – areas which need maintenance, revegetation, or flood control improvements. Parcels in fair condition typically have a consistent but sparse covering of native and/or non-native vegetation. Poor Condition – areas which need significant maintenance and revegetation. This condition is typically due to poor soils or erosion resulting from past flooding. The uneven terrain makes weed cutting with heavy equipment difficult and potentially dangerous." (38)

General Condition of City-Owned Property
"The majority of City-owned property is at least in *good* condition, with minimal weeds and a consistent vegetative cover. However, some of the areas in good condition may need additional restoration to transition from non-native to native species to optimize enhancement for wildlife." (38)

" . . . 8% of [City-owned] land (1,765 acres) is *Class I and II Wildlife Habitat*; 20% (4,642 acres) is in *excellent* condition; 57% (12,933 acres) is in *good* condition requiring little maintenance; 11% is in *fair* condition requiring regular maintenance and revegetation; and 4% is in *poor* condition." (39)

Condition of North Simpson and Santa Cruz Farms
On AVLUS Figure 12, *Condition of City of Tucson Property*, North Simpson Farm is identified as being in "poor condition." The north half of the west section of Santa Cruz Farm is also identified as being in "poor condition," while the remainder of the Santa Cruz Farm is identified as being in "fair condition."

On AVLUS Figure 9, *Vegetation and Wildlife*, the Santa Cruz River corridor through North Simpson Farm is identified as "Class II Habitat."

Revegetation Needs/Opportunities
"A revegetation program is still needed for a few parcels. Several parcels require flood control and/or grading in order to make the cutting of weeds and revegetation feasible." (8)

"Approximately half of the property needs [some] revegetation, and/or control of weeds, dust, and erosion." (ii)

"Public agencies are willing to work with the City to restore vegetation and enhance habitat, creating an opportunity for the City to demonstrate environmental leadership." (iii)

Tumbleweed

"Russian thistle (often called "tumbleweed") tends to be the first plant species to establish itself after land is disturbed from its natural state. Russian thistle is designated by the State of Arizona Department of Agriculture as a noxious weed that requires control. In addition, protection of adjacent active farms and grazing in the area necessitated active thistle control as a good-neighbor policy. Thistle grows quickly, can ruin existing crops, and creates extreme fire hazard." (7)

Private Sector Restoration Proposal/Initial Cost

In December 1994, a land restoration business made a proposal to the Mayor and Council Environmental Subcommittee for restoration of City-owned property in Avra Valley. . . . [The] proposal was made to revegetate these areas with native species by utilizing 25-30 types of seed. Approximately 500 acres of land could be revegetated each year. It was estimated that the cost to seed the acreage is about $100.00 per acre . . . (13)